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CONTENTS.

Original Communications.

PAGE

Glandular Tumors of the Neck. By J. William White, M.D. 217
The Prophylaxis of Tuberculosis. By Karl von Ruck, B.S., M.D. 221
A Study of the Relationship between the Eruption of the Permanent Teeth and the Ailments of Late Childhood. By Louis Starr, M.D. 228
On the Treatment of Puerperal Hemorrhages. By E. P. Hurd, M.D. 237
A Case of Acetanilide-Poisoning. By S. T. Armstrong, M.D., Ph.D. 245

Leading Articles.

Antiseptic Surgery in General Practice 247
A New Antipyretic 249
The Cumulative Action of Certain Medicines 251
The Evils of Hypnotism 252
Orexin, a New Stomachic 252

Reports on Therapeutic Progress.

The Use of Santal Oil 246
The Safe Passage of a Sharp Piece of Glass through the Digestive Tract 254
Injections in Acute Gonorrhœa 255
The Use of Air in the Examination and Treatment of Cavities and Canals with the Aid of Reflected Light 256
Angina Pectoris in the Heart Palsy of Acute Specific Infective Disease 256
The Treatment of Fever 257
The Effect of Antipyrin on the Solubility of Caffeine 259
Cystitis in the Female 260
The Action of Camphoric Acid on the Night-Sweats of Phthisis 260
Nitrate of Potassium for Malarial Fevers 261
Sodium Creosotinate 261
Treatment of Chronic Diarrhœa 262
Potassium Bromide as an Antidote to Iodoform 263
The Physiological Treatment of Obesity 263
Symptoms of Lesions of the Spinal Cord 264
The Physiological and Therapeutic Action of Creosotinic Acid 265
Balsam of Peru in Phthisis 266
The Production of Nephritis by Balsam of Peru 266
Nervous Affections in the Course of Whooping-Cough 267
A New Surgical Dressing 267
Pancreatic Diabetes 267
Salol and Terpine Hydrate in Colds 268
Narcotic Effects of Essence of Nutmeg 268
Physiological Action of Selenious Acid 269
Lymphadenoma and its Treatment 269
Use of Resorcin in Whooping-Cough 270
Magnesia Isinglass as a Substitute for Plaster of Paris 270

Reviews 271

Correspondence.

Paris Letter 276
Berlin Letter 278
London Letter 280

Notes and Queries.

Abrus-Poisoning 282
The Active Principle of the Condurango Bark 283
Saline Injections into Veins in Diabetic Coma 283
Duboisine 284
Soluble Saccharate of Iron 284
Anisodus Luridus 285
The Mode of Action of Diuretics 285
Scopolia Atropoides 286
The Cause of Pallor 287
Guarana in Chronic Diarrhœa 287
The Infection of Catgut Ligatures 288
Adulteration of Tea in China 288
The Effects of Antipyrin in Whooping-Cough, Chorea, and Enuresis 288
Menthol in the Vomiting of Pregnancy 288

Original Communications.

GLANDULAR TUMORS OF THE NECK.

By J. William White, M.D.*

THE series of cases which I shall bring before you to-day will serve to illustrate the chief varieties of glandular swellings affecting the cervical region, and for the sake of completeness as well as on account of their great frequency I have included among my cases certain specific swellings not usually classed with tumors. First, a few words as to the anatomy of the parts whose pathological changes and clinical symptoms I am about to consider. The usual convenient classification of the lymphatic glands of the neck is into the superficial and deep sets, the former being found between the platysma and sterno-mastoid muscles, often following the course of the external jugular; the latter (*glandulæ concatenatæ*) forming an unbroken chain from the base of the skull to the clavicle, lying along the sheath of the great vessels and by the side of the œsophagus and trachea; between the carotid and the transverse vertebral processes; following the anterior border of the trapezius, or occupying the supra-clavicular fossa. These glands may enlarge so as to become a source of trouble to the patient or of interest to the surgeon from a variety

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of causes which by way of systematizing the subject we may divide into three great classes.

1. Glandular enlargement from constitutional causes.

2. Glandular enlargement from constitutional causes plus local irritation.

3. Glandular enlargement from local irritation alone.

In the first group are included swellings arising from *a*, syphilis; *b*, carcinoma; *d*, lymphadenoma. Of these the first is much the most frequent.

Syphilis.—This patient is a typical case of this character. A young adult, with a history of suspicious exposure some ten weeks ago, observed three weeks later that a small indurated spot appeared behind the corona glandis, which has remained indolent and painless, slightly elevated, and with scarcely any discharge, just as I show it to you to-day. It was followed, however, in due time by enlargement of the inguinal lymphatics, and then—almost a week ago—by involvement of the cervical chain, especially those along the edge of the trapezius. This is an unmistakable history, and of course leads us unerringly to the diagnosis of syphilis. The prognosis is unqualifiedly good as to everything but the entire disappearance of the swellings. They never give rise to pain, never suppurate, never constitute a noticeable deformity, but a slight degree of tumefaction usually persists in spite of well-directed constitutional treatment. Local treatment is of no value.

A rarer condition of cervical glandular enlargement, associated with syphilis, I show you in this man who, a month ago, fell and struck his mouth, cutting his lower lip against the edge of his upper incisors. A week ago the trifling sore, which had nearly healed, enlarged, broadened, became covered with a grayish slough, rose above the level of the surrounding surface of the lip, and developed a distinctly hardened base. Since then the glands beneath the chin and in the submaxillary region have enlarged so that you can see them from a distance. This is undoubtedly a case of infecting chancre, and, on inquiry, we learn that this man was in the habit of smoking the pipes of some of his fellow-laborers even while he had the recent cut of the lip. The glandular swelling is therefore the characteristic syphilitic bubo, and will subside under specific treatment. [The sore disappeared promptly under the administration of mercury, and the tumefaction of the glands also subsided, though more slowly.]

Carcinoma.—This is the only class of these swellings that I am unable to illustrate clinically to-day. Primary carcinoma of the glands of the neck is extremely rare. When it does occur it is recognized by the rapid growth of the swelling, its stony hardness, its fixity, the early implication of muscles, fascia, and skin, the development of cachexia, etc. The prognosis is, of course, unfavorable, and operative treatment is not very satisfactory unless the case is seen quite early, and yet it does not follow that the unfortunate patient should be deprived of whatever benefit might result from excision. In many cases the symptoms are most distressing. Pressure on the carotid and jugular causes annoying vertigo, disturbance of vision, etc.; on the sympathetic and on the various cervical nerves, often produces severe neuralgia and sometimes ptosis, irregular dilatation of the pupil, one-sided flushing of the face, etc.; on the œsophagus and trachea, results in dysphagia, dyspnœa, or even aphasia. In such cases it is justifiable to operate, with the clear understanding, on the part of the patient, that the procedure is palliative and the equally clear determination, on the part of the surgeon, to make the operation as thorough as possible, even if, as advised by Mr. Jessett, it is necessary to tie the carotid and jugular above and below the growth. Return of the neoplasm is, of course, almost certain, but it is sometimes delayed for months or even years, during which there is comparative comfort and freedom from pain.

Lymphadenoma.—This patient is a young girl whose appearance will at once attract your attention. She is pale almost to bloodlessness, with dilated pupils and an expression of profound weakness. You can see that she has on both sides of her neck rounded tumors, and, on palpation, these are found to be made up of elastic, mobile, painless glands, rounded, soft or fluctuating, and without evidence of inflammatory action. A further examination reveals similar enlargements in both axillæ and in the right groin, a marked increase in the size of the spleen, and it is reported to me that there is a notable increase in the proportion of white corpuscles in the blood. The disease is evidently lymphadenoma (or Hodgkins's disease) together with leucocythæmia. The prognosis is unfavorable. Operation is contraindicated. The treatment should be tonic and hygienic. Sea air, arsenic, iron (especially the iodide), cod-liver oil, etc., are the usual remedies, and they are usually disappointing.

The second group of glandular tumors includes those in which there is an underlying constitutional condition with a certain degree of local irritation superadded. These are decidedly the most important from the surgical stand-point, as affording the largest field for operation with the best prospect of permanent good results. The word "scrofulous" would describe the growths belonging in this class, but that word demands some little definition.

At the present time it is very generally accepted that scrofula and tubercle are pathologically, or at least etiologically, identical, for the reasons that the same characteristic products are found in both affections; that such products, taken from so-called scrofulous glands and inoculated on other animals, produce tuberculosis; and, finally, because the bacillus of tubercle is frequently present in scrofulous diseases and has all the properties of the same bacillus when associated with genuine tubercle. The acceptance of this theory should have great weight in deciding the course of the practical surgeon in his management of cases of this character.

There can be little doubt that glands affected with this form of tubercular inflammation are liable to become foci of infection, not only for other glands immediately connected with them, but for the general system. While, of course, there is the greatest possible difference between the progress of a case of acute tuberculosis and that of scrofulous gland disease (which may be regarded as the two clinical extremes of the tubercular diathesis), yet so long as we do not know the exact relation which one bears to the other, but do know that their etiology and their pathological anatomy are identical, and that either one may give rise to the other, we certainly have a clear indication for operative interference in those cases which resist other forms of treatment.

A case of this character will probably have the following characteristics: The patient will be comparatively young, very often between the ages of three and fifteen; there will be a family history of scrofula or consumption; some source of local irritation will be discovered, such as a carious tooth, a suppurative otitis, enlarged tonsils, post-nasal catarrh, eczema of the scalp, or some similar irritating cause; the patient has the so-called scrofulous physiognomy, is dull and stupid in appearance; the glands themselves are more solid and less elastic than in lymphadenoma; they are more fixed and more tender than are the glands in that disease, and have a less wide-spread distribution; they are especially apt to undergo the change known as caseation, the cheesy degenerated product either remaining harmless or, like any other foreign body, setting up suppuration and causing the formation of an abscess.

The treatment of such conditions may be considered, following the excellent classification of Mr. Frederick Treves (whose writings upon this subject, together with those of his brother, the surgeon to the Royal Hospital for Scrofula, at Margate, are without exception the most authoritative in recent times), by clothing the patient carefully with wool; sending him to some sea-side or mountain resort, preferably the former; the administration of tonics, such as arsenic, iron, quinine, and cod-liver oil; the removal of the local irritation, whatever it may have been, which gave rise primarily to the glandular inflammation; the employment of rest by use of a stiff collar or stock; the inunction of some resolvent ointments, such as the ointment of iodide of lead, etc. Under this combined treatment many scrofulous enlargements will entirely disappear; and I show you here two cases in which glands that a few weeks ago constituted a mass as large as a small apple have now become imperceptible to sight, and barely to be found by touch.

But in hospital practice particularly, and in patients whom you do not see in the early stages of the growth, this treatment cannot be satisfactorily carried out. Poor people cannot go or send their children to the sea-shore or to watering places in the mountains, and they are very apt indeed to neglect the most essential of the methods of local treatment, namely, that of rest for the head and neck. Such was the history of the three cases which I now show you, and which only presented themselves at this clinic after the glandular mass had attained a size varying from that of a cocoanut to that of a child's head. They have been operated upon by me as you know, at the different ward classes and with the assistance of members of your class.

In such cases operation must be thorough and unsparing, and these are typical examples of the difficulties and dangers which surround these extensive dissections of the neck. In each case it was necessary to lay bare both the anterior and posterior cervical triangles, to dissect the sterno-cleido-mastoid free for its entire length, and, in one, to divide it in the middle and turn it upward and downward.

In all of them the growth required to be dissected carefully from the great vessels, particularly from the internal jugular vein, which is chiefly endangered in these cases. In all of them also the growth extended into the supra-clavicular fossa and had to be separated from the immediate neighborhood of the subclavian vessels and the brachial plexus. The phrenic was exposed lying on the scalenus anticus in two of the cases, and in all of them the dissection had to be carried down by the side of the trachea even to the œsophagus and the transverse processes of the vertebræ. The cardinal secret of success in these operations is to keep on the tumor,—that is, to cut with the knife, or to scratch with a grooved director, through the bands of connective tissue which hold the gland down to the neighboring parts, doing this cutting and scratching directly upon the glands themselves at safe limits from the edge nearest to important structures. By doing this patiently it is remarkable what enormous growths of this kind may be safely removed. These cases are convalescent and in none has there been the least alarming symptom since the operation. The highest temperature reached was 100.5° and in each case union by first intention took place through the entire length of the skin wound. Free provision for drainage is made by the use of large rubber drainage-tubes for the first twenty-four or forty-eight hours, at the end of which time they are withdrawn wholly or partially and are replaced by strands of catgut. The wound is brought together with sutures of silver wire or silk-worm gut, and is covered with cyanide gauze, and all the hollows of the neck from the chin to the clavicle are filled with bichloride cotton, which is held in place by a bandage in the shape of a double figure-of-eight of the head and neck, and neck and axilla. It is rare that more than two or, at the most, three dressings are necessary, and the wound is usually healed completely in about ten days, but such good results can only be obtained if, after the operation, the head and neck of the patient are immobilized by the employment of sand-bags placed on either side of the head as the patient lies supine, and heavy enough to prevent rotation of the head on the spine.

The third and last group of cases includes those in which the cause is simply local irritation without the admixture of constitutional infection of any sort. I am enabled to illustrate this form of glandular swelling by this young man, whose swollen and protruding under lip is in striking contrast with that of the patient with labial chancre, whom you saw a few moments ago. He gives us a history of herpetic ulceration followed by a diffuse general inflammation of the cellular tissue of the lip, running into suppuration and to the formation of the labial abscess which I now evacuate. As a result of this local inflammatory process there has been a similar process set up in the cervical glands, especially in the submaxillary region and its vicinity. We find an illy-defined, tender, hot, hard, red, brawny swelling with a focus of softening already, although the whole trouble is of but one week's duration. Emptying of the small glandular abscess with the cure of the original source of trouble will probably cause the disappearance of all the symptoms in a few days.

In *résumé* let me reiterate the chief characteristics of these different forms of glandular tumors of the neck:

1. Lymphatic enlargements, situated in the neck and dependent on constitutional causes, may arise from syphilis, carcinoma, and lymphadenoma.

When from *syphilis*, they affect by preference the posterior chain of glands, are small, freely movable, painless, bilateral, and yield readily to specific treatment.

If *carcinomatous*, they form a very hard, rapidly-growing mass, infiltrating surrounding parts, becoming fixed to everything beneath it, involving the skin, causing serious pressure symptoms, and followed by the development of cachexia. Operative treatment is useful, though only palliative.

If *lymphadenomatous*, they are rounded, regular, movable, painless, elastic or fluctuating, do not affect the skin, and are associated with anæmia, leucocythæmia, and with enlargement of other and widely removed lymphatics and of the spleen. The treatment should be tonic and supporting. Operative interference is useless.

2. *Scrofulous adenitis* is essentially a tubercular inflammation of glands, occurring usually in young persons with a scrofulous or phthisical family history, and with some form of local irritation superadded, which must be sought for in the mouth or pharynx or about the face or head. The glands are all characterized by a tendency to caseation, with or without suppuration, and form indolent masses, less defined, more fixed, and more tender than in lymphadenoma. The treatment in recent cases should be first hygienic and tonic with fixation of the head, and, if

possible, with cure of the proximate cause. If this fails, or without attempting it in old cases, excision should be resorted to.

3. *Simple adenitis* results from some source of local irritation, and constitutes an acute, tender, inflamed, poorly-defined swelling, running a rapid course to either suppuration or resolution. Treatment should consist in removal of the cause and in the application of resolvent lotions or ointments, or, later, in the free evacuation of pus.

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*THE PROPHYLAXIS OF TUBERCULOSIS.**

By Karl von Ruck, B.S., M.D.†

"WITHOUT bacillus no tuberculosis" is a dictum to which every modern pathologist unhesitatingly subscribes.

Accepting this, and believing the bacillus of Koch to be the only direct etiological factor of all tubercular disease, experience has taught us in addition that a favorable soil for its growth and development is essential, which is furnished by the tissues of certain individuals, whom we say possess a predisposition to tuberculosis.

To prevent tuberculosis, the indications based upon its etiology are to destroy all tubercle bacilli, or matter containing them, or, if that be impossible, to protect the predisposed individual from contact with them, and, failing in either, to eradicate the predisposition.

According to the measure of success with which we comply with these indications, tubercular disease must become less frequent or disappear altogether. Although eight years have now elapsed since the discovery of the bacillus of tuberculosis, and the incontrovertible proof furnished by Koch and others of its causal relation to all tubercular disease, and the indications for prevention, as here set forth, have existed for all this time, it does not appear that any appreciable reduction in the occurrence of, or death-rate from, the disease has been accomplished; and we naturally have to conclude that either the etiology is wrong, or the indications are impossible to comply with, or that for some reason the necessary attention to prophylactic measures has not been given.

It is hardly necessary that I should review all the facts existing to confirm the now generally accepted opinion, that the bacillus of Koch is the sole cause of tubercular processes. The foremost bacteriologists, pathologists, and clinicians of the world have accepted this with a unanimity scarcely ever before or since witnessed in any scientific discovery; and the occasional feeble efforts to disprove or question the causal relation of the bacillus to the disease in question may be passed without further notice, coming, as they do, from sources where original investigations have either not been the basis for the opinions advanced, or where the facilities at command or methods employed were singularly defective.

Neither can the apparent failure of our prophylactic measures be ascribed to the impossibility of carrying them out, and while the ideal may never be reached, as I shall show further on, enough may be accomplished to make them felt more distinctly and surely than has been the case heretofore.

In our efforts to devise a curative method of treatment by germicidal agents, I believe the prophylaxis has for the time received but limited attention; but with the realization that a specific treatment is not likely to be discovered in the near future, more attention will, of necessity, fall to the subject of prevention.

To comply with the indications set forth depends directly upon the public, particularly the patients, their friends, and attendants; indirectly, however, very largely upon the professional adviser, who alone can point the way by educating the interested, and suggesting the means to the end, and, as far as we have neglected to do this, the fault for better results lies at our own door.

The public, and more particularly the subjects of the disease and their attendants, cannot do their part unless we teach it to them, and while some vague idea exists that the disease is communicable, the sources of infection and the mode in which the infecting material gains entrance to the organism are little, if at all, understood outside of the medical profession. Even here, from the lack of preventive measures adopted in individual cases, which come constantly under our notice, one might almost feel tempted to believe that a considerable number of our professional brethren are as ignorant as are the laity; for it would seem that even a non-believer in the value of Koch's discovery, or in the contagiousness of tuberculosis, through the medium of disease-secretions, would, in view of the generally-accepted opinion to the

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contrary, give those who come in contact with tubercular patients the benefit of doubt, since the measures to be adopted are not only harmless, but all tend to cleanliness, which is said to be next to godliness!

I believe, however, that the true reason for the indifference to prophylactic measures in practice must be explained by the fact that many practitioners seldom make an absolute differential diagnosis between tubercular and non-tubercular affections, and we hear thus of consumption of a non-tubercular character, of chronic or interstitial pneumonias, of broncho-pneumonia and peribronchitis in contradistinction from tubercular disease of the lungs; and of strumous synovitis, arthritis or tumor albus, instead of tubercular disease of the joints, when a microscopical examination of the secretions from the parts involved has never been made, perhaps not even been thought of, and tubercular disease is more or less strongly suspected only, in rapidly-progressing or far-advanced cases.

All such practice must stop before much can be accomplished in the prevention of tuberculosis. We must become sufficiently expert in the use of the microscope for diagnostic purposes, so we can at least make a reliable examination of sputa and other human excretions. We must certainly have such examination made for us by a brother practitioner, in case we have not the time, apparatus, or ability to do it ourselves, and much good would result if we all could realize that the microscope can be of much greater aid to successful practice, and can preserve us from more serious blunders, as can, for instance, the fever thermometer, without which we would almost feel ourselves lost, especially in the treatment of febrile affections.

To a successful prophylaxis of tuberculosis an early diagnosis is highly essential, for infection may occur from subjects in the beginning of the disease. I have myself demonstrated the bacilli in the bloody expectoration after a slight initial hemorrhage, when there were no other symptoms whatever, either preceding or immediately following, to justify the diagnosis of tuberculosis. On the contrary, the assurance had been given by another practitioner that the hemorrhage was from the throat, and merited no serious consideration. However, my diagnosis, confidently made at that time, received subsequently the saddest confirmation.

It is, therefore, plain enough that if the true diagnosis is delayed until the disease becomes almost self-evident, susceptible individuals may have become infected, especially as such frequently exist as members in the family of such patients. Besides, the most favorable period for successful management of the case itself will have been allowed to pass by, and, although less apparent, we are under such circumstances no less culpable than had we jeopardized the lives of others, as well as that of the patient, by failure to properly diagnose small-pox, diphtheria, or scarlatina, in neglecting unerring methods of diagnosis, and treated our patient for some other malady.

Let us, therefore, make sure that we perform our whole duty, in the first place, to those who place their health and lives into our keeping, and next to the public at large, as educators and advisers in matters pertaining to public health and to our profession as ministers to the sufferings of humanity. Let us set an example for integrity of purpose to allow no opportunity to escape, which may aid in restricting and preventing the ravages of a disease which is, of all diseases, the most prolific cause of death, and claims its victims by the hundreds of thousands every year, respecting no one, not even our own persons or families.

The inherent desire for self-preservation on the part of man and the well-grounded fear of the disease by mankind in general will become our faithful allies in our efforts for its prevention; and even by the few of us here assembled much may be done directly, and indirectly by example, if we will avail ourselves of this advantage and of every opportunity, and continue determined and unremitting in our efforts.

To this end we must strive to become more and more accurate diagnosticians, both in microscopical and physical examinations, bearing constantly in mind that the medicine of the future is "preventive medicine," especially so in the disease under consideration; and that in the light of its etiology every case we see resulted from the ignorance or carelessness of some one, for which some member of our profession may be directly or indirectly responsible. Let us see to it that those whom we advise professionally shall understand the contagiousness of tuberculosis and the usual mode of communication from those who suffer from the disease. Let us in our practice insist upon the measures which the etiology naturally suggests for its prevention, and never become discouraged by the wide dissemination of the infecting material.

Although a matter presumably well known to all of us, allow me to review the sources and modes of infection as we understand them at the present time, and the means they suggest for prevention.

We believe that the morbid secretions from the parts or organs involved in tubercular disease contain the bacilli of tuberculosis, as do the tissues which are the seat of the disease. We also believe that while infection does occasionally threaten from tubercular animals, infection is by far more likely to occur through contact with the human subject.

Experience has demonstrated that secretions containing bacilli cannot give off the germs while in the moist or wet state, but that they find entrance into the organism usually by inhalation, the excretions having first become dry and pulverized, and then taken up by currents of air in the form of dust. Further, that the sputum of subjects of pulmonary tuberculosis is of all the excretions the greatest source of danger, the bacilli in such sputum retaining their vitality for weeks and months.

We further believe that if these specific germs or spores find entrance into the tissues of susceptible individuals, tuberculosis of the organs invaded will follow, but that there are individuals who for the time being are protected from such infection,—*i.e.*, they possess a sufficient cell-resisting power; so that the struggle which ensues between the living cells of the organism and the infecting bacilli becomes readily determined in favor of the former, the bacilli being destroyed without injury to the organism.

The announcement of Metchinkoff regarding the method of infection and resistance offered to the bacilli on the part of the organism is certainly very interesting, and has received some confirmation from other observers. According to him, the particular cells which carry on the defensive action are the so-called phagocytes, which, in the first place derived from the wandering leucocytes, are later re-enforced from the fixed connective tissue-cells, and appear immediately at the point of invasion, by the irritation set up, and practically devour the intruders, taking them up within their cell envelope, there to become disintegrated. This Metchinkoff and others claim to have actually observed in experimental inoculation under the microscope, not only in tuberculosis but also in other diseases due to infection by micro-organisms, the result of the battle between the combating cells determining the disease and the life or death of the organism.

Whether or not Metchinkoff's announcement will stand the test of further research, it appears very reasonable, and, were it not for this successful resistance offered by our living tissues, the whole of the human family would long ago have perished from tuberculosis and other infectious diseases.

To destroy all tubercular matter, or the germs and spores therein contained, before it can become dry, and as fine powder or dust mingle with the air we breathe, or to keep it in a state of moisture until all germ life shall have ceased, fulfils every indication for successful prevention of infection by inhalation.

In the nature of human affairs we can, however, only hope to approximate this, more or less, according to the control we have or exercise over the subjects of the disease. Much more can be done than is the case at the present time, for once understanding the danger, our patients aid us in our efforts according to their intelligence. I find that the great majority of cases coming under my care never had a microscopical examination made of their expectoration, and seem to be entirely unaware of any danger to others. Certainly, they have no knowledge that they need to exercise any care or circumspection in the disposition of their sputa.

I find no opposition to my rules that sputa must only be deposited into the expectoration vessels containing a disinfectant fluid, and never upon handkerchiefs, bedding, clothing, carpets, floors, walks, streets, or the ground; and that in case of accidental soiling of any thing or place, the matter is to be promptly attended to, by subjecting the article or place to hot water containing corrosive sublimate 1 part in 500 or 1000.

To provide for emergencies, should the patient find himself without proper expectoration vessels, Dr. Dettweiler, the director of the Falkenstein Institution for Consumptives, provides his patients with small expectoration flasks, to be carried in the pocket.

Finding some disregard to their use, I have adopted what I believe to answer as well,—the use of paper napkins, cut up into small pieces, which are carried by the patients, and, after use, placed into an envelope, to be afterwards destroyed by fire or deposited into the large expectoration vessels containing disinfectants at the earliest opportunity. Small pieces of newspaper answer the purpose as well.

I find that, since I make the danger of infection so very plain to my patients and their attendants, and especially since I point out to the former the possibility of becoming re-infected, or of infecting their still healthy lung portions, by their own or others' carelessness, and that this may possibly determine the final result in a given case; and since I warn the latter that by the patients' carelessness their own life may become jeopardized, I have a co-operation on the part of all as sincere as it is effectual; and the least deviation from my rules regarding this matter by fellow-patients is promptly and confidentially reported to me and my assistants.

I am aware, gentlemen, that I thus make much of the supposed danger, and, perhaps, more than is strictly warrantable, inasmuch as experience has well established, that despite unfavorable surroundings, direct infection does not always result; but, as we understand the subject now, we must admit that a certain degree of danger exists, and therefore our precautions cannot be too thorough, and for the best results we must make the patients and attendants interested parties, as they really are.

I allow no final disposition of secretions from tubercular patients without previous disinfection; they are then deposited into properly-trapped sewers, in the absence of which, burial in ground, not likely to be disturbed, would suggest itself.

Aside from the danger from inhalation of tubercle bacilli, or particles of dust containing them, infection of the alimentary canal may occur from the ingestion of food derived from tubercular animals, or such food which may have accidentally become contaminated with secretions from tubercular patients.

That such infection may occur has been demonstrated experimentally upon the lower animals, and been clinically confirmed in many instances. Here, too, a certain general predisposition is essential in addition to functional disturbance of the digestive organs, which latter seems to stand in close relation to such infection. As long as the gastric juices are normally secreted, the germs are not apt to pass the stomach in an active condition. This, for instance, is plainly much more likely to occur in the presence of gastric catarrh, especially of infants and others, who, on account of the anæmia often associated, are thereby predisposed subjects as well.

Secondary tubercular disease of the intestinal tract is, no doubt, frequently due to swallowing of expectoration containing bacilli, adhering to the mucous surfaces of the mouth and fauces, especially when, as is often the case, the patient is subject to gastric disturbances.

Against tubercular food products from animals we have a most efficient protection by subjecting the milk and flesh from doubtful sources to boiling, and by careful attention to all digestive derangements in predisposed and tubercular patients. Tubercular mothers should not only never nurse their children, but should relinquish their care to healthy persons. Especially should they be warned not to kiss their children upon the lips. Kissing by tubercular persons of their friends and relatives is a source of danger to the latter at all times, and no sentimental notions should be allowed to interfere to make known such danger to the interested parties.

Tubercular persons should never be allowed to prepare food or handle eating-utensils, as cooks or servants in our families; particles of expectoration are frequently projected from the mouth in the act of coughing, unconsciously, and we can never be sure of such persons being so scrupulously clean as to eliminate all sources of danger.

The common use of eating-utensils, of handkerchiefs, table-, room-, and bed-linen by infected and well people must be strictly forbidden. All these require exposure to boiling water or other disinfection before they can be properly used by those whom we desire to protect. These are, indeed, matters of common cleanliness, to which, nevertheless, the attention of the intelligent needs to be directed; the ignorant must certainly be closely watched.

It is of the greatest interest to any community, but especially to one like Asheville, which, as a much-frequented resort, both by the predisposed as well as by the actual sufferers from the disease, harbors a large number of susceptible and infected individuals, that, for the welfare of all concerned, the dangers, sources, and modes of infection shall be thoroughly understood; and I take this opportunity of appealing to every board of health, and especially to the medical members of the board of health of our city, to seriously consider the propriety of issuing printed directions and rules to the public, particularly to the hotels and boarding-houses, setting forth the dangers, and giving proper instructions for their avoidance. Especially would I recommend the frequent scrubbing and washing with disinfecting

solutions of the furniture, floors, walls, and wood-work of rooms occupied by tubercular patients, as also the care necessary regarding eating-utensils, linen, etc.

Particular stress should be laid upon the necessity of thorough disinfection of the entire room and its contents before it may again be occupied by another person, after having been occupied by a consumptive.

I have repeatedly demonstrated to myself that a house or institution where many tubercular patients reside may be made a source of *protection*, rather than infection, by conscientiously following the rules advocated in this essay and carried out in my institution. After over four years of constant association with such patients, no case of infection has occurred, not even in my *personelle*, several of which are clearly predisposed or recovered subjects.

Microscopical examinations of dust from rooms occupied by patients in my institution, and whose sputum showed the tubercle bacilli in great numbers, and the dust collected from most favorable places, and upon the day before the usual general cleansing, never showed even one single bacillus of tuberculosis. Error was excluded by a test experiment upon two occasions, where, in the dust from a room, in which a tubercular patient had been confined in his own home, both spores and bacilli were found in each specimen examined.

Similar have been the results following such inquiries in a number of good institutions for consumptives in Europe, and such evidence, although showing only an *incidental* advantage, is a strong plea in favor of treating consumptives in special sanitariæ only.

But even in private practice, I am well satisfied that, if we will do our part faithfully and take advantage of all opportunities, the dangers from infection may be so materially diminished, that in due time an unmistakable reduction in the death-rate from the disease will become manifest.

Equal care is essential in the disposition of urine, fæces, and pus, when tubercular disease of the kidneys, the intestine, joints, and other localities is present. I have only recently demonstrated tubercle bacilli in the pus from a rectal ulceration, and some years ago found them in the pus from a suppurating cervical gland, there being no disease demonstrable in any other organ. Infection in this case probably occurred through the lymphatics of the mouth. The lady in question had recently nursed a tubercular father until his death; and it is of interest in this connection that I persuaded this patient to allow me to excise two recently enlarged glands from the neck of her 7-year old daughter, and in every section made from these glands tubercle bacilli were present. I have since made it a practice, as a preventive measure, to remove all chronically enlarged glands in the neck which do not yield to the usual remedies, and in several of such glands, although not in all, I found the bacilli.

I come now to the consideration of the predisposition and the means for its eradication, as well as to the methods to be employed, for the more successful protection of those in whose constitution the predisposition has become permanently fixed.

Wherein this predisposition actually exists is a most difficult and vexing question.

We know, indeed, sometimes at a glance, the looks and appearance of persons predisposed to tuberculosis. We also know the most important and usual causes which produce the predisposition, and therefore are, as a rule, not hampered or perplexed in diagnosis; but why in these cases the power of resistance of the tissue-cells should be so diminished, is not to be demonstrated, inasmuch as we are unable to show either morphological, chemical, or physiological differences between the tissue-cells of the predisposed and of those who successfully resist tubercular infection.

We have, therefore, refuge to theory, and reason from experience that all living tissues require proper nutrition, and want of such leads to a weakened state or death of the tissues involved; in other words, that the life and vitality of living tissue stands in intimate relation to a proper nutritive supply, and with the theory of imperfect nutrition as the cause for diminished vitality and resisting power, we must be content in our present state of knowledge, the more so as we succeed in eradicating the predisposition in part, or entirely in proportion as our measures based upon this theory are successful.

The disposition to tubercular infection is either inherited or acquired. The inherited form is best known and described as the "phthisical habitus," consisting in slender stature, with elongated flat thorax, a peculiar vulnerability of the mucous membranes, especially of the respiratory organs, leading to frequent acute and eventually chronic catarrhal processes; in an easily-excited, small vascular system, with a disproportionately small heart, as compared with the lungs,

which is frequently the subject of palpitation; in a tendency to glandular enlargements, narrow lymph spaces, etc. These variously associated, some more or less predominating features can be readily believed to be factors in the production and maintenance of nutritive disturbances, especially of the respiratory organs, where, besides the undue proportions between lungs and heart, additional causes for local anæmia can be referred to anatomical relations; as, for instance, the position of the upper lobes, which are the almost constant seat of initial changes.

The rarity with which we observe pulmonary tuberculosis associated with the common valvular affections of the heart, and the frequency with which we find it associated with stenosis of the pulmonary orifice, goes to show that an overfilled lesser circulation protects from, and the reverse condition predisposes to, tubercular infection.

In this connection Volland refers to the relation and anastomosis between the nutrient bronchial arteries and the pulmonary artery and veins upon the bronchial mucous membranes, as well as the deeper tissues, the former also giving off numerous branches to the pulmonary system. If, now, the blood-pressure in the lesser circulation is diminished, the lateral pressure to the nutrient bronchial vessels is diminished in proportion, thereby allowing and favoring a ready flow of blood from the bronchial to the pulmonary vessels, without having first given off sufficient nutrient material to the lung-tissue. From their position the apices would naturally suffer first.

The phthisical habitus may also exist in more or less pronounced form when no family history of tuberculosis can be elicited, and phthisis frequently occurs in the offspring of tubercular or predisposed parents, such offsprings having apparently a splendid physique, but although strong and vigorous up to a certain age, yet in due time fall ready victims to the disease.

When neither phthisical disease or predisposition on the part of parents exists, and still a phthisical habitus is present, we find, upon careful inquiry, as Brehmer has pointed out long ago, that some other constitutional malady or nutritive derangement, especially on the part of the mother, existed at the time of conception or during gestation. I have often been surprised at the regularity with which it is found that the parents were syphilitic or scrofulous; that the mother was in very poor health before or during the pregnancy; that the subject of the phthisical habitus is the fifth, sixth, or a later child, or is born of parents one or both having been given to sexual excesses, whereby, in addition to rapidly succeeding births, the procreative powers could be believed to have become weakened or partially exhausted. In such instances we learn that the older children are strong and well, but the last had never been strong like the others, and had always a poor and capricious appetite.

So children of phthisical or predisposed parents, although not possessing the pronounced physical characteristics of predisposition, acquire the disease frequently in inverse order of their ages, the youngest suffers first, and so on, and frequently the older children escape.

All this tends to show that there is a certain relation between the vigor and strength of the parents on one part, and the nutritive processes of their children on the other.

The acquired predisposition may be temporary, as in anæmia following acute and exhausting diseases, and may afterwards be readily recovered from. A person may, therefore, be predisposed at one time and not at another, or it may be more lasting when damage has resulted from various influences tending to debility and feebleness of the organism, among which may be enumerated insufficient food and clothing, long-continued hardships, exposures, damp and cellar-like habitations, mental and physical overexertions, previous disease, deleterious effects from occupation, remorse, long imprisonment, and especially want of out-of-door life and physical exercise, all these influences operating with more force during the period of development and growth. To illustrate, I need only call your attention to the frequency with which we observe tubercular disease to develop in young girls and boys working in factories, or to follow long-continued gastric and intestinal affections and the consequent anæmia, but more particularly diseases in which the respiratory organs are involved, such as measles, whooping-cough, catarrhal pneumonias, etc., and point out the great mortality from phthisis in penal institutions, amounting in many prisons to over sixty per cent., whereas the general death-rate from this disease is less than fifteen per cent. Surely, if we review these known causes, there appears no lack for opportunity for the efforts of not only the medical profession, but also for those of

the humanitarian, statesman, and public economist to bring about a change for the better.

To prevent the inherited form we cannot hope, for it means to prevent marriage, and the bearing of children not only by the already affected but also by those predisposed to tubercular disease.

As professional advisers, we are not often consulted in the making of marriages, and consulted or not, our interpositions are seldom, if ever, heeded. Certain it is, it is as thankless as it is useless to interfere upon grounds, as a rule, entirely beyond the appreciation of the interested parties.

Our efforts must, therefore, be directed towards the eradication of the inherited or acquired predisposition, which offers a large field for our labors in the application of the necessary hygienic and therapeutic measures, the enumeration of which for special conditions would, however, extend this paper too far. They must vary not only with the indications of the particular case, but also with the social or financial conditions of the patient, all having for their object the improvement of the nutritive processes in general and of the lungs in particular, by bringing to the normal lost or impaired functions.

In addition to the measures which can be applied at home, we can derive most potent aid from the employment of climatic influences, which should be taken advantage of whenever possible. I say "in addition," and want to emphasize it, for it is most unreasonable to expect everything from climate, whose influence can only be fully exerted when old and vicious habits and conditions are eliminated, and a proper hygienic life takes their place, and when other existing therapeutic indications are also complied with; for acquired chronic disease must be overcome here as well as there, and climate in the presence of morbid states is simply an aid in their removal more or less important. Patients will commit errors of diet in any climate, the skin will require care, catarrhal states of the digestive organs must be cured, nasal disease, with obstruction by hypertrophies, and new growths must be properly treated. The predisposed require advice as to time and amount of out-of-door life and exercise at climatic resorts as well, if we want to obtain the best results.

In the selection of climate we must be largely governed by accumulated experience; while any change which takes the individual out of his accustomed habits and associations, and brings new ideas, rest, and out-of-door life, will be beneficial; some localities and regions have been found especially beneficial for those predisposed to or already suffering from tubercular disease, in aiding the restoration of normal functions, and, at the same time, exerting an undoubted protecting influence from infection.

We have learned from carefully conducted investigation and reliable mortality statistics that tubercular disease is much more frequent in some localities than in others, and that there are some places the native residents of which enjoy an almost absolute immunity, as is the case with the residents of the Asheville plateau. This immunity appears uninfluenced by the sojourn in such places of many tubercular individuals, and must, therefore, depend upon the rapidity with which the disease germs lose their infecting properties, or the more successful resistance which the tissues are able to offer to infection, or both.

From a general survey of such climatic resorts, we find they have many things in common,—they are either elevated several thousand feet above sea-level and mountainous, or are sea-coast localities, with the general air-currents from the sea; they have a porous soil, natural drainage, usually a cool, but not too cold, relatively dry atmosphere, plenty of sunshine, and, wherever it has been determined, the air contains ozone much in excess of the amount found at less unfavorable places, at which it frequently is entirely absent or only present in traces.

The increasing interest in medical climatology will undoubtedly lead to more accurate data on this subject. To me it seems probable that the ozone is one of the most important factors, as to it may be justly attributed the demonstrated absence of disease germs in the air of such places, exerting its germicidal influence upon the tubercle bacilli as well, thus becoming a curative and protecting agent at the same time. This would also account for the fact that tubercular disease keeps in abeyance, in spite of the many tubercular patients visiting such places; and ozone, as an active form of oxygen, in addition to favorable conditions of temperature, sunshine, and humidity, is a stimulant, leading to better appetite, digestion, and nutrition, and we will not have to strain our belief too much in ascribing to it both an influence for protection and a better resisting power of the organism.

By taking proper advantage, both of direct

and climatic management, in a considerable number of cases, the inherited disposition may be entirely eradicated, especially if our measures are taken early, during the period of development and growth; and the subject may be allowed to return to his former place of residence, being cautioned to an out-of-door life of regularity, free from all excesses. In the acquired form, a favorable result obtains the more readily, unless the disposition is continued by incurable disease. When the disposition has become permanently fixed, a continuous residence in a favorable climate, and there in the open country, where contact with tubercular patients does not occur, becomes imperative. I would lay especial stress upon the necessity of predisposed individuals avoiding close association with cases where the actual disease is already developed, until we can have a much better and systematic co-operation by all concerned to the necessary preventive measures from infection by bacilli-containing secretions. Several cases have come to my notice where it appeared that in families with hereditary predispositions, and where sufferers from the disease were entertained as boarders, the disease developed in members that could not be supposed to have been infected before being removed to the favorable climate.

Before closing this paper, I cannot but recur to the appalling death-rate from tuberculosis in our penal institutions, in which a sentence for a long term of years becomes almost a death-sentence eventually; and, after a considerable number of years of imprisonment, when the disease usually develops, the disposition having been acquired by remorse, unhygienic surroundings, and especially by want of out-of-door life and exercise.

It is certainly not the intention of our laws to add such a probability as a part of the punishment. We had better condemn the criminal to death at once, rather than to compel him to serve a long term of imprisonment, and then have him almost surely fall a victim to preventable disease, during the continuance of which he becomes in addition a source of danger to his fellow-man.

The partial adoption by our State of convict labor upon public works, which keeps the well prisoner separated from infected subjects and gives him an out-of-door life, although perhaps not inaugurated for the purposes for which I advocate it, is a most salutary measure, deserving imitation by other States as well. I understand, however, that such outside labor is practically confined to colored convicts, and from my stand-point this would appear to be a discrimination against the whites.

In many States the convicts are still hopelessly confined within the walls of the prison, or even a single cell, with but an hour per day for walking exercise out of doors, the weather permitting; and the serious attention to this matter of our law-makers and prison reformers is urgently demanded for their efforts to secure an ample amount of out-of-door life to every convict whom we desire to reform but not to kill.

In conclusion, I may say that, although no original contribution has been made in this paper which might lead to the speedy extermination of all tubercular disease, I nevertheless hope that the incomplete review given may for all of us be the means for the revival and increase of interest in, and for more persistent efforts towards, a successful prophylaxis of tuberculosis.

ASHEVILLE, N. C., February 2, 1890.

A STUDY OF THE RELATIONSHIP BETWEEN THE ERUPTION OF THE PERMANENT TEETH AND THE AILMENTS OF LATE CHILDHOOD.

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ERUPTION OF THE PERMANENT TEETH.

THE eruption of the milk teeth, though physiological, is so uniformly regarded as dangerous, that both physicians and parents congratulate themselves when infants under their charge pass through this process without trouble, or safely weather the various diseases that may arise during its course. The interval between the fourth and thirtieth months of an infant's life—the period of primary dentition—is an era of great and widely-extended physical progress. The teeth are advancing; the follicular apparatus of the stomach and intestinal canal is undergoing development in preparation for the digestion and absorption of mixed food; the cerebro-spinal system is rapidly growing and functionally very active, and the organs and tissues of the whole body are in a state of active change. This period of normal transition must also be one in which there is great susceptibility to abnormal change or disease, provided there be a causal influence at work. Such an influence may either originate outside of the

body, as when there is exposure to cold or to contagion, or come from within in the form of some perversion of a physiological process.

Difficult dentition stands prominent in the latter class. During it, irritation of the gums very often produces stomatitis with fever, and the fever in turn leads to enfeebled digestion and impaired nutrition, conditions that open the way to catarrh of the mucous membrane of the bronchial tubes and gastro-intestinal tract, and to other intercurrent affections. Again, the local irritation may be reflected through the widely extended connection of the dental nerves, and give rise to well-known disorders of distant organs and tissues,—for example, the brain, eyes, stomach, skin, and so on.

With these conditions fully recognized, it is surprising that second dentition has not been accorded the position it deserves as a cause of ill-health in later childhood. In second dentition the elements of local irritation with fever are quite as potent as before. There is, however, less activity of development or rapidity of change, if we except the radical alteration in the system occasioned by the approach of puberty. Therefore there must be less susceptibility to disease, and this fact, taken with the greater resisting power of advancing age, fully accounts for what every observer will find to be true,—namely, that the disorders of this period are less frequent, and, as a rule, less dangerous than those that attend the cutting of the milk teeth. Nevertheless the etiological relations of the eruption of the permanent teeth will fully repay a careful study.

The subject will be considered here in its relation to the time between the fifth year and the establishment of puberty, when childhood is over and youth or maidenhood begins.

The permanent teeth are cut in the following order:

1. Four first molars, five to six years.
2. Four central incisors, six to eight years.
3. Four lateral incisors, seven to nine years.
4. Four first bicuspids, nine to ten years.
5. Four second bicuspids, ten to twelve years.
6. Four canines, eleven to thirteen years.
7. Four second molars, twelve to fourteen years.
8. Four posterior molars (or "wisdom teeth," not entering into this study), seventeen to twenty-one years.

Of the twenty-eight teeth cut within the period already mentioned,—the fifth to the fifteenth years,—the first and seventh sets are developed *de novo*, and are more likely to give rise to trouble, particularly of the oral mucous membrane. The other sets take the place of corresponding milk teeth, and appear in very much the same order, the lower central incisors appearing before the upper, the upper lateral incisors before the lower, the upper bicuspids before the lower.

As these teeth approach the surface, absorption begins in the alveoli and at the roots of the deciduous teeth, and this continues until the teeth are loosened and readily extracted, or, if this be not done, until little is left but their crowns.

When the first and second molars approach the surface, the gums, just as in primary dentition, become red, swollen, rounded, and tender. The salivary secretion is increased, the mouth is hot, the patient complains of aching in the gum, and, on account of tenderness, refuses food requiring mastication. With the other sets there is a gradual loosening of the superimposed temporary teeth, pain on mastication, redness and tumefaction of the gum, and augmented flow of saliva. As there is no impairment of the general health, these trifling symptoms must be regarded merely as manifestations of the progress of a physiological process. Such are the normal manifestations.

The most common disorders of second dentition are (*a*) those of the mouth and throat; (*b*) of general nutrition; (*c*) of the stomach and intestinal canal; (*d*) of the cervical lymphatic glands; (*e*) of the eyes; (*f*) of the ears; (*g*) of the skin; (*h*) of the respiratory tract; and (*i*) of the nervous system.

a. Oral pain is often intense. It is lancinating or neuralgic in character, and may either be limited to the position of the advancing tooth or extend throughout the upper and lower jaws,—the region supplied by the dental branches of the trifacial nerve. Sometimes the pain is referred to the eye, the ear, the face, or even to the forehead. Pain associated with tenderness most frequently attends the eruption of the first molars; then there is also redness and marked swelling of the gum, as in primary dentition.

The redness and swelling about an advancing tooth, or around a loosened milk tooth, may, in debilitated or strumous subjects, extend to the mucous membrane of the whole mouth and give rise to catarrhal stomatitis. Again, as one of the first or second molars advances, the mucous mem-

brane of the gum, directly over the tooth, breaks down, and a circular ulcer is formed. This ulcer possesses all the characteristics of the marginal ulcer of ulcerative stomatitis, and is very liable—provided such favoring conditions as scrofula and bad hygiene exist—to run around the alveolar border and extend to the inside of the cheek. A case has recently been under my care in which all of the six-year molars were cut in this way, the resulting ulcerative stomatitis producing considerable discomfort, but yielding readily to treatment.

Superficial ulcers upon the edges and tip of the tongue are often encountered. These ulcers correspond in position and number to loosened and, perhaps, decaying deciduous teeth; are due to constant irritation of the mucous membrane; are the seat of moderate pain, and more or less interfere with the movements of the organ in mastication and speech. They vary in shape and size, but are generally oval, with the greater diameter—rarely more than half an inch—extending in the direction of the axis of the tongue. Their bases are smooth, red, and shining, and their edges red, indented, somewhat indurated, and surrounded by a narrow band of white fur formed upon the neighboring healthy epithelium.

A boy, 10 years old, was recently brought to consult me about the condition of his tongue. Nearly two months before, the anterior deciduous molars had commenced to loosen. Soon after, two ulcers appeared upon the tongue at points corresponding to the loose teeth in the lower jaw. These caused considerable discomfort and interfered with the movements of his tongue. Six weeks later the four loose teeth were extracted. At the time of his visit the points of the permanent teeth were distinctly visible. The ulcers, which presented the characteristics already described, were present too, but they were much contracted and evidently in process of healing. This case is a clear illustration of the etiology of the condition, and of the rapid effect of the removal of the cause.

Loss or perversion of taste, depending upon reflected irritation of the gustatory and glosso-pharyngeal nerves, has occasionally arisen in my experience. It is a feature that may be readily overlooked in childhood, and without doubt has never received due credit as a cause of the anorexia so often observed during second dentition.

Of throat affections, simple hypertrophy of the tonsils and follicular tonsillitis seem particularly apt to arise in late childhood. The extension of catarrhal inflammation from the mouth to the throat is certainly an element in the causation of the conditions, though anorexia, imperfect digestion, and fever are more potent, as they lead to impaired nutrition and increased susceptibility to the action of cold and bad hygienic surroundings.

The treatment of this class of affections must vary with the symptoms presented. Should there be much inflammation and pain about a loose tooth, great relief can be obtained by painting the gum three or four times daily with a solution of—

℞ Cocain. hydrochlorat., gr. iv;
Glycerinæ, ʒii;
Aquæ, q. s., ad ʒi. M.
Sig.—For local use.

When the first or second molars cause the trouble, free lancing, with an oblique crucial incision, is to be recommended. Much good can also be done in the way of softening the gums and lessening pain by a thorough application of—

℞ Zinci chloridi, gr. i;
Vin. opii, ʒi;
Glycerinæ, ʒii;
Aquæ rosæ, q. s., ad ʒi. M.
Sig.—Apply to tender gums with a brush or soft cloth thrice daily.

Such measures, too, will be more successful in relieving referred pains than any direct application to the place of reference.

Catarrhal and ulcerative stomatitis demand the usual methods of treatment.

Superficial ulcers on the tongue can often be healed by a daily application of a solution of nitrate of silver (ten grains to one fluidounce), and the frequent use of a borax or chlorate of potassium wash (fifteen grains of either to one fluidounce). Should there be much pain and discomfort, the solution of cocaine recommended above may be used two or three times daily. When the deciduous teeth are decayed, however, nothing short of their extraction will cure the ulceration.

Nothing can be done for loss or perversion of taste except removing loose teeth and freely lancing the gum over advancing molars.

Hypertrophy of the tonsils and follicular tonsillitis must be treated in the same way as when they occur independently of dentition, the question of the propriety of extraction and of lancing being always borne in mind.

b. After safely passing through primary dentition, children usually grow robust and enjoy good health, unless they be attacked by some one of the acute contagious diseases to which their age is liable. This state of affairs may happily endure throughout the remainder of childhood, but it is often supplanted, during the sixth and following years, by a condition best described as one of "general debility."

This ill-health is neither produced by disease of important viscera, as of the lungs, heart, kidneys, and digestive organs, nor can bad hygiene be blamed in many cases. For the explanation one must look rather to an impairment of nutrition, resulting from the constitutional strain of cutting the second teeth, from the moderate fever associated with the process, and from the diminished consumption of food, attending oral discomfort, and painful mastication. The severity of the symptoms depends somewhat upon the general vigor of the subject attacked, though, in my experience, it bears little or no relation to the difficulty or ease of cutting the milk teeth.

Early in the sixth year, children so affected begin to lose their rosy cheeks; the lips grow pale; the skin of the body becomes sallow and harsh; the hair dry and lustreless; and there is moderate loss of flesh, with flabbiness of the muscles. The face wears an anxious expression, and the temper is unstable; by day frequent complaints of weariness are made, and little interest is taken in play, while at night sleep is restless, and there is often slight fever, with a temperature rarely above 100° F. Pain and discomfort in the mouth are constant symptoms, and, as these are increased by mastication, there is apparent anorexia. Examination of the mouth reveals redness, swelling, and tenderness of the gums over advancing molars, or, if these have been cut, around loose temporary teeth. The bowels are inclined to constipation, and the urine limpid and voided in abundant quantity; the pulse is rather feeble, though normal in frequency, and, as a rule, there is no cough nor other alteration in the respiratory function. Careful investigation shows an absence of lesion in the heart, lungs, or kidneys, and of disease of the abdominal glands or digestive tract. As the teeth of the advancing group are cut, the symptoms disappear, to return with the approach of each succeeding group, but the anterior molars generally give rise to more marked disturbance than any of the teeth that replace the temporary set.

In addition to the ordinary risk of intercurrent disease, existing in every case of general debility, the condition just described is very apt to be complicated by bronchitis or catarrh of the gastro-intestinal canal. Pyrexia, although it is comparatively slight in second dentition, accounts for this, for a feverish child is very susceptible to cold, and very liable to have his digestion disordered by food upon which he has previously thriven. The first cause, by driving the blood from the surface, produces bronchitis; the second, by direct and indirect irritation, leads to catarrh of the mucous membrane of the stomach and bowels.

This knowledge, taken in connection with the course and history of the case and the condition of the mouth, should enable the observer to attribute the illness to its proper source rather than to any complicating affection, although the latter undoubtedly accentuates the symptoms, and may force itself into prominence. The negative results of physical exploration of the heart, lungs, and abdominal organs,—particularly the mesenteric glands,—and of examination of the urine, are also important in establishing the correct relations of cause and effect.

Careful regulation of the diet and the administration of tonics, the methods of treatment that would naturally be suggested, are of little avail, unless oral pain and difficulty in mastication be relieved. Even then it is often impossible to do more than maintain a moderate degree of health until advancing teeth are completely free.

Free lancing of the gums over molars, the application of cocaine to painful gums surrounding loose temporary teeth, the extraction of these when the substituting teeth are so advanced as to run no risk of impairing the arch of the jaw, regulation of the diet and hygiene, and the employment of tonics and laxatives are the measures to be recommended. The diet must be simple, non-farinaceous, and nutritious; it is better to allow four small meals a day than three large ones. Of tonics, a good formula is—

℞ Tr. nucis vomicæ, ♏xii;
Elix. cinchon. ferrat., ʒvi;
Syrupi, ʒss;
Aquæ, q. s., ad ʒiii. M.

Sig.—Two teaspoonfuls thrice daily at the age of six years.

Syrup of the iodide of iron, bitter wine of iron, and an emulsion of cod-liver oil, with lacto-phosphate of lime, are also very useful. The best laxatives are fluid extract of senna,

which may be combined with the tonic mixtures; tincture of aloes and myrrh in small doses three times daily, compound licorice powder, gluten suppositories, or laxative tamarinds.*

Complicating bronchitis and catarrh of the gastro-intestinal canal demand active attention and little else can be accomplished until they are relieved.

c. Disorders of the digestive system, while unattended by such marked symptoms, and rarely reaching the same degree of danger as in primary dentition, are among the most common of the disturbances produced by the eruption of the second teeth. One cause of this is the intimate sympathy existing between the different portions of the digestive tract, and leading to reflection of irritation from point to point. Another and more active cause has already been indicated. It involves two conditions. First, general depression of vitality, — from constitutional strain, fever, and so on,—with a corresponding weakening of the function of digestion, so that food previously suitable and easily assimilated becomes relatively too coarse and "strong;" and, being more or less imperfectly changed and absorbed, lies in the alimentary canal undergoing fermentation and decomposition with the formation of irritant acids and gases. Second, the well-recognized susceptibility of the gastro-intestinal mucous membrane to become inflamed, or to assume the catarrhal state, when subjected to the action of irritants. A susceptibility decided enough under the best of circumstances, but intensely marked if the general health and resisting power be below par.

Anorexia, vomiting, acute gastric catarrh, chronic gastro-intestinal catarrh, and diarrhœa are the more common of the digestive disorders attending second dentition. Loss of appetite, when not due to perversion of taste, generally forms but one member of a group of symptoms depending upon catarrh of the stomach, and can be best studied under this head. The same may be said of vomiting. Of each of these symptoms it is also true that they may be so prominent as to mask the associated features unless the observer be very careful.

Acute gastric catarrh, in so far as it is related to second dentition, is most frequently encountered during the eruption of the six-year molars. The attack of so-called "biliousness" and "indigestion," may or may not be preceded by some indiscretion in diet. Very often, without any departure from ordinary rules, the mother notices that her charge becomes listless, has a hot, dry skin, loses appetite, is thirsty, complains of headache, abdominal discomfort, and nausea, and sleeps uneasily. Soon there is vomiting of sour-smelling, imperfectly-digested food, followed by painful retching, with the expulsion of small quantities of bile-stained mucus. Next the tongue becomes covered with a thick, yellowish-white fur, and the breath has a heavy, sour odor. There is decided elevation of temperature (99° to 101° Fahrenheit); the pulse is increased in frequency (110 to 120); the bowels are confined and the urine diminished in quantity, and lateritious. Tenderness of the epigastrium is generally noticeable. The attack may terminate suddenly, at the end of twenty-four hours, with several loose fæcal evacuations, or convalescence may extend over a period of three or four days; the fever gradually subsiding, nausea and thirst disappearing, the tongue clearing, and appetite returning.

The temporarily-enforced fast and the light diet indicated for a few days after such an attack insure immunity from future trouble for a short time, but as long as the molars are working their way through the gum, an error in diet, or even a return to ordinary food, may occasion a relapse. It will fully repay the physician to inspect the mouth of every six-year old patient (and upward) suffering from acute indigestion, and, after making the examination thoroughly, to lance swollen gums over advancing molars, and apply soothing lotions to irritated gums about loosened temporary teeth, or order extraction if admissible. General treatment must be conducted on the same plan as when the attacks, as is often the case, occur independently of dentition. The important points are careful regulation of the diet, or the withholding in bad cases of all food for twenty-four hours; counter-irritation to the epigastrium by sinapisms; the use of ice and iced Vichy water to relieve thirst, and the employment of remedies calculated to check nausea, and at the same time act gently on the bowels. A favorite method with the writer is to divide the elements of a Seidlitz powder into equal parts, say eight for a child of six years, dissolve a portion from each in a tablespoonful of cool water, pour together, add cracked ice, and administer while effervescing.

* See Starr's "Diseases of Digestive Organs in Children," page 211.

The well-known combination of calomel and soda is also very efficient, for instance:

℞ Hydrarg. chloridi mit., gr. i;
Sodii bicarb., gr. vi;
Sacchari, gr. xxx.
M. et ft. chart. No. vi.

Sig.—One powder every two hours until all are taken, or until the bowels act freely.

It is difficult to display too much caution in returning to a full diet, and, in spite of the protestations of parents, extreme moderation should be the rule until local irritation be relieved.

Chronic gastro-intestinal catarrh owes its origin to second dentition more frequently than to any other cause save whooping-cough. In this condition—so aptly termed by Eustace Smith "Mucous Diseases"—there is a mucous flux from the whole internal surface of the alimentary canal, which mechanically interferes with the digestion and absorption of food and greatly impedes nutrition. It may be met with at any time during the eruption of the permanent teeth.

The affected child is emaciated and weak. His face is pale, though subject to marked changes in color. At times a circumscribed crimson flush appears on one or both cheeks. Again, there is so much pallor, particularly about the lips, that fainting seems imminent. The eyes are surrounded by bluish circles, that deepen when the face pales; the conjunctivæ are muddy, and there is occasional squinting. The skin is sallow, dry, and rough; the hair lustreless and faded. There is decided pallor of the oral mucous membrane; the tongue is flabby, indented by the teeth, and glazed; and the breath is heavy and fetid. The appetite in the beginning fails, then becomes capricious, and, finally, is almost insatiable. Eating is followed by a sensation of drowsiness, and by eructations of flatus and acid liquid.

Tympanitic distention of the belly and pain are always present. Pain may be general, when it amounts to little more than a sensation of soreness, or, more frequently, it is limited to the left hypochondrium, and then is stitch-like in character. Either variety may be constant or present only after meals; in the former case there is a temporary increase of discomfort after eating. Paroxysms of severe pain about the umbilicus, with great pallor of the face, are sometimes observed.

Constipation of the bowels is usual, and the evacuations, which take place at intervals of two or three days, are scanty, and composed of small, hard, dark-colored lumps, with a quantity of mucus. By day the patient suffers from headache; is languid and ill-tempered. At night he is restless, grinds his teeth, starts from sleep in terror caused by frightful dreams, screams or laughs incoherently, and for a time seems unconscious of his surroundings. Somnambulism and nocturnal incontinence of urine are quite common.

There is no alteration of the temperature, the pulse is feeble, and there is frequently a slight, dry, hacking cough, unquestionably due to reflex irritation of the larynx. The urine is diminished during the continuance of severe pains, but is voided in large quantities at the termination of the paroxysms.

At intervals of two or three weeks, violent vomiting and purging occur. During these attacks, which last from one to three days, a large quantity of mucus is expelled; there is slight fever; and the tongue becomes less flabby, more pointed, and covered with a thick, white, feathery fur, except along the sides, where several smooth, red, glazed patches of variable size and shape, with irregularly-indented margins, appear. The cleaning-out process is followed by temporary improvement, but the symptoms slowly return and grow worse, to culminate in another attack.

The course of mucous diseases is very protracted, extending over months, and, while there is no regular progression, the symptoms tend to grow more and more severe as time lapses.

Hacking cough, emaciation, and debility may suggest tuberculosis. A diagnosis, however, can be readily made by noting the state of the tongue; the mucous stools; the color and condition of the skin; the absence of pyrexia, except in the attacks of vomiting and purging; the periodicity of these attacks; the diurnal drowsiness and nocturnal terrors, and the irregularity of the course. At the same time, the onset of the symptoms, after the commencement of second dentition, is a point of importance.

Mucous disease is not dangerous in itself, though, by reducing the strength, it predisposes to other and much more fatal diseases.

After removing oral irritation so far as possible, there are several rules of management to be enforced. First, all articles of diet that readily undergo fermentation must be withheld, and food should be given in moderate quantities and at shorter intervals than in

health, so that, while the stomach is at no time overdistended, enough nourishment may be ingested. Of permissible articles, milk, eggs, and lean meat are the chief, though fresh fish, raw oysters, cauliflower tops, spinach, asparagus, lettuce, and stewed celery can be used without ill-effect. With such a list to select from, it is an easy matter to write out a suitable dietary, and to make changes sufficiently often to avoid cloying the appetite by monotony. Filtered water or Vichy should constitute the drink, except there be great debility, when whiskey or old dry sherry are useful; they must be well diluted and given in carefully-proportioned doses with the meals.

Next, the activity of the skin must be maintained by general baths, followed by inunctions of olive oil, and by keeping the surface carefully covered with woollen underclothing. Finally, exercise in the open air on suitable days in winter, and an almost complete outdoor life in summer, greatly favor recovery.

Medicinal treatment is of minor import, but by no means to be neglected. The indications are to check the secretion of mucus; to neutralize the irritating acids formed by fermentation of the food; to restore the mucous membrane to a normal condition, thereby improving secretion, digestion, and appetite; and to secure regular action of the bowels and the expulsion of collected mucus and fæces. These ends accomplished, strength and health return, though it may be necessary to call in the aid of tonics.

Alkalies are the best remedies to check the secretion of mucus, and to liquefy it so that it may the more readily be removed. They are also most efficient in neutralizing the acid products of fermentation. Simple bitters, too, have some power in lessening the formation of mucus, and considerable influence in arresting fermentation; at the same time they give tone to the mucous membrane, and stimulate digestion. Laxatives keep the bowels clear. Of the first class, bicarbonate of sodium; of the second, gentian and columbo; and of the third, senna or aloes are to be preferred.

A very serviceable prescription is—

℞ Potassii iodidi, gr. vi;*
Sodii bicarbonatis, ʒi;
Extract sennæ fld., fʒiii;
Inf. calumbæ, q. s., ad fʒiii. M.

Sig.—Two teaspoonfuls three times daily before eating, for a child of six years.

* The iodide of potassium is used to increase the activity of the salivary and gastro-intestinal glands.

After food, it is well to order from ten to twenty drops of tincture of aloes and myrrh in a little water, for its powerful tonic action on the intestinal mucous membrane. Should tonics be needed in the after treatment, tincture of nux vomica and ferrated elixir of cinchona are the best. In order to prevent a relapse, mixed diet must be avoided for at least two months after convalescence is fully established, and, to confirm the cure, a change of air, by a trip to the mountains or seashore, is advisable.

Diarrhœa is a very constant attendant upon second dentition. It is most apt to arise in the changeable weather of spring and autumn or in the heat of July, August, or September. In this respect it resembles the diarrhœa so common with primary dentition; but, unlike the latter, it shows little or no tendency to run into entero-colitis. Two forms are met with,—namely, catarrhal diarrhœa and lientary. Catarrhal diarrhœa is accompanied by slight furring of the tongue, loss of appetite, and abdominal pain of a colicky nature. The evacuations are frequent, light yellow in color, and offensive, semisolid, or liquid. For the relief of these cases, all that is required, beyond attention to the mouth, is a bland diet, perhaps a dose of castor oil, and some mild astringent mixture. For example, let the patient take for breakfast a soft-boiled egg, milk with lime-water, and stale, dry bread; for dinner, some meat broth (free from fat), stale, dry bread, and rice and milk pudding; for supper, milk, and stale, dry bread. After the dose of oil, to be given when pain is marked, a good astringent mixture is—

℞ Tr. opii deod., ♏xii;
Bismuth. subnitratis, ʒi;
Syrupi, fʒss;
Mist. cretæ, q. s., ad fʒiii. M.

Sig.—Two teaspoonfuls every two hours.

The treatment may terminate with a course of wine of pepsin, or of pepsin with dilute muriatic acid.

Lientary depends upon great irritability of the intestine and exaggerated peristalsis. The stools are limited to four or five a day, and are composed of almost completely undigested food and mucus. An evacuation occurs in the morning, soon after rising; the others during or immediately after meals. They are preceded by griping pain, and by so urgent a desire that the little sufferer has difficulty in waiting for the chamber or reaching the closet. Nux vomica, followed by

arsenic, are the remedies to be employed. For instance, until the stools become less frequent and urgent, and the griping pain diminishes, a good prescription is—

℞ Tr. opii deod.,
Tr. nucis. vom., aa ♏xlviii;
Aq. menth. pip., q. s., ad f℥iii. M.
Sig.—One teaspoonful before each meal, at the age of six years.

Afterwards—

℞ Liquor. potassii arsenitis, f℥i;
Inf. gentianæ comp., q. s., ad f℥iii. M.
Sig.—One teaspoonful after each meal.

Of course, the diet must at the same time be carefully regulated.

The general depression produced by the coming of the second teeth would naturally favor the development of any constitutional tendency, and, having traced the connection in several instances, I have no doubt that not a few cases of tubercular ulceration of the bowels owe something to this etiological factor.

d. Enlargement of the submaxillary gland, and one or more of the lymphatic glands of the neck, is a frequent occurrence during the approach of the first molars. Patients so affected may at the same time present other evidences of difficult dentition; for example, they often show the symptoms of "general debility" already referred to, and often have mucous disease, but they are quite as frequently perfectly healthy in constitution as strumous.

The swelling of the gland or glands is moderate in degree; there is considerable hardness, moderate tenderness, and pain, but the superimposed skin is movable and healthy. There is some tendency to chronic enlargement and induration, though little or none to suppuration, save in scrofulous subjects.

Should the gums be thoroughly lanced,—and it is often necessary to sink the knife-blade deep to free the coming tooth,—the glandular swelling soon subsides, though resolution can be hastened by painting with tincture of iodine, or using the following ointment:

℞ Ichthyol, ℥i;
Lanolin, ℥i. M.
Sig.—Apply to the enlarged glands three times daily, with rubbing.

e and *f.* Conjunctival blennorrhœa and otitis, sometimes noticed during primary dentition, have come within my observation, but, from the intimate connection between the nerves of the ear and eye and those of the teeth, it is more than probable that certain other disturbances of these two organs of special sense arise during second dentition and depend upon dental irritation. Unfortunately, so few cases of disease of these two organs come under my notice, and so little attention has been paid to this causal relation by specialists, that I have no data upon which to base conclusions.

g. Herpes of the lips, eczema, and urticaria frequently appear during the eruption of the second teeth. They apparently depend upon gastro-intestinal disturbances, and are relieved by measures directed to the cure of disorders of this tract, together with appropriate local treatment, and attention to the teeth and gums.

h. Nasal catarrh, "teething cough," and an increased susceptibility to catarrh of the bronchial mucous membrane are the chief affections of the respiratory tract.

Nasal catarrh is generally subacute in type, and is attended by hypertrophy and redness of the Schneiderian membrane. There is a more or less copious discharge, which has a slight, heavy odor, may be composed of thin mucus or of muco-pus, and which sometimes dries into thick crusts. This catarrh occasionally runs into ozæna in weak and strumous children.

Attention to the teeth, frequent syringing of the nostrils, with insufflation of boracic acid and bismuth (1 part to 2), the occasional application of a weak solution of nitrate of silver (gr. v to f℥i), judicious use of the electro-cautery, and the administration of tonics, constitute the best treatment for the ordinary form of catarrh. Ozæna calls for its special plan of management. "Teething cough" is due to reflex irritation of the pneumogastric nerve; it is identical with the "stomach cough" of mucous disease. Bronchitis can never be said to be due directly to dentition. This cause acts only indirectly, by reducing general vitality and the power of resisting disease, and thus rendering the delicate bronchial mucous membrane more than ordinarily susceptible to catarrhal inflammation from chilling of the surface and exposure to damp air. An attack of bronchitis may occur with the eruption of one group of permanent teeth, or the attack may be repeated with several successive sets.

I have in my mind now the case of a delicate boy, who, in spite of the utmost care on the part of his mother, had a most severe

bronchitis during the eruption of the six-year molars, and a second persistent attack while the four central incisors were pushing their way through. Not two months before writing this, he again came under my care, suffering from a third attack that promised equal obstinacy. On inspecting the mouth, the four lateral temporary incisors were found to be loose, and their permanent substitutes evidently advancing rapidly. Extraction of the loose teeth was ordered, together with a mild expectorant and a tonic mixture, and the catarrh soon subsided.

i. Nervous disorders, both sensory and motor, are encountered.

Headache is common. The pain is usually temporal and unilateral. It may be seated, however, in the occipital region, or in different parts of the face, and sometimes shifts suddenly from the temporal to the occipital region. It is lancinating, more or less constant, with no distinct intermissions, and during its continuance there is restlessness, anorexia, a frequent, hard pulse, sweating, dilatation of the pupil on the affected side, and, perhaps, dimness of vision, diplopia, and colored or uncolored spectra. One or more painful points can often be detected, and generally there is a hard, tender, moderately-enlarged lymphatic gland in the submaxillary or cervical region.

These attacks are due to disordered vaso-motor innervation, depending upon irritation of the sympathetic nerves, and producing irregular contraction or spasm of the vessels,—the temporal or occipital artery, as the case may be. The real source of irritation is to be found in the mouth. The mode of action may be twofold. First, from a swollen gum or carious tooth, the lymphatic vessels readily convey irritating matter to a neighboring lymph gland, and the irritation here excited acts, in its turn, as a disturber of the sympathetic nerves, which furnish the vaso-motor supply to the carotid artery and its branches. This theory of the production of migraine has the value of the support of T. Lauder Brunton.

The other method of production—and this I simply submit for consideration—is one of direct nervous connection, the submaxillary ganglion acting in the case of the lower teeth and the spheno-palatine in the upper, as the medium of transfer of irritation to the vaso-motor nerves.

Bromo-caffeine, gelsemium, saline laxatives, and tonics may be employed to lessen the severity of the pain, but lancing, extraction, or proper "filling" are the only certain remedial measures.

The motor disturbances, while not quite as common as the sensory, are more varied. Reflex spasm and paralysis of the eyelid have been noted.* The former I have frequently seen, but the latter, so far as I can recall, has never fallen within my experience. For the reflex spasms no method of treatment availed until the dental irritation was removed, and the same statement may be hazarded *a priori* in regard to paralysis of the lid.

More extended paralysis also occurs. In this connection I can do no better than quote the words of Brunton, the correctness of which I can fully confirm. After speaking of paralysis of the eyelid, this author states: "Sometimes, however, paralysis occurs of a much more extensive character, in consequence of dental irritation, especially in children. Teething is recognized by Romberg and Henoch† as a frequent cause of paralysis, appearing in children without any apparent cause.‡ According to Fliess, paralysis of this sort occurs more commonly during the period of the second dentition, whereas convulsions generally occur during the first. Its onset is sudden. The child is apparently in good health, but at night it sleeps restlessly and is a little feverish. Next morning the arm, or, more rarely, the leg, is paralyzed. The arm drops; it is warm but swollen, and of a reddish-blue color. It is quite immovable, but the child suffers little or no pain. Not unfrequently paralysis is preceded by choreic movements. Sometimes recovery is rapid, but at other times the limb atrophies, and the paralysis may become associated with symptoms indicating more extensive disturbance of the spinal cord and brain, such as difficulty of breathing, asthma, palpitation, distortion of the face, and squint, ending in coma and death.

It is only in very rare instances that we are able to gain any insight into the pathological anatomy of such cases, because they rarely prove fatal, and even when they do so, the secondary changes are generally so considerable as to leave one in doubt as to the exact mode of commencement. This renders all the more valuable the case recorded by Fliess, in which a boy, 5 years old, and apparently quite healthy, found his left arm

* Brunton.

† *Klinische Wahrnehmungen und Beobachtungen.*

‡ Fliess, *Journ. der Kinderkr.*, 1849, July and August.

completely paralyzed on awaking one morning after a restless night. The arm was red, but the boy suffered no pain, and played about without paying much attention to the arm. The same day he fell from a wagon upon his head, and died in a few hours. Apart from the fracture of the skull, which caused his death, the anatomical appearances which were found were congestion of the spinal cord, and great reddening and congestion of the meninges near the point of origin of the brachial nerves, where the veins were also much fuller than on the corresponding right side. There was no organic change perceptible, either in the spinal cord or in the brachial nerves. On the other hand, the turgescence of the veins extended from the shoulder and neck up to the face, and was very striking in the submaxillary region.

This vascular congestion seems to point to vaso-motor disturbance of a somewhat similar kind to that which we have already noticed in connection with occipital headache, or with migraine, accompanied by subjective appearance of either form or color.*

This form of paralysis certainly suggests acute anterior poliomyelitis, though the symptoms are not quite identical, and the age is not that at which "infantile palsy" usually occurs.

Unfortunately, in all but the mildest cases, which get well quickly, when the paralysis appears the mischief is done, and little benefit can be expected from attention to the teeth. The treatment must be conducted on the plan usually adopted in infantile paralysis.

As just stated, dental irritation sometimes produces choreic movements as prodromata of paralysis, but it much oftener acts as the exciting cause of genuine chorea in nervous children. Approaching molars, or carious, loose milk teeth about to be shed, may be the source of irritation. The causal relation is proved by the fact that the chorea disappears or yields quickly to ordinary treatment when the new teeth pierce the gums or are freed by lancing, or when decaying teeth are removed. Epilepsy is another nervous affection which can occasionally be traced to the same source. In such cases one usually finds a history of repeated general convulsions during primary dentition.

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* Brunton, "Disorders of Digestion," p. 93.

ON THE TREATMENT OF PUERPERAL HEMORRHAGES.

By E. P. Hurd, M.D., Newburyport, Mass.

By puerperal hemorrhages are understood the hemorrhages of the first six months of pregnancy which generally terminate in abortion; hemorrhages occurring during the last three months, whether "accidental" or due to placenta prævia; hemorrhages during labor, and secondary hemorrhages coming on after labor; in other words, all hemorrhages occurring during pregnancy, parturition, and the puerperal state.

THE HEMORRHAGES OF ABORTION.

Considering the immense losses of blood attending abortions, it is a wonder that so few women die. I have never seen any statistics giving the mortality from abortion, but I am certain that very few women die from hemorrhage alone. In a practice of twenty-five years, I have never seen a fatal case of the kind. In the first few months of pregnancy, bleeding from a detached placenta is easily controlled by tamponading and the free use of ergot; the alert physician is generally master of the situation. But where the unfortunate patient is alone and cannot have the help of a physician, her life is fearfully in jeopardy. An instance of this kind constitutes the basic fact in a criminal abortion case, which threatened to be the subject of a trial before the Superior Court in this district; it has really been put off from court to court for several years. This woman, who was in a weak state of health and a multipara, actually flowed to death before delivery of the placenta. No physician was summoned, and nothing was done to save the poor woman's life till the case had become hopeless. The autopsy showed the placenta to be loose in the uterus. The verdict of the medical examiner was "death from hemorrhage."

In the treatment of threatened abortion, the first question to ask is, Can the hemorrhage be arrested without terminating the pregnancy? If the flowing be but trifling, if the os be undilated, if labor has not commenced, there may be hope that no irreparable mischief has been done to the vessels of the utero-placental circulation. It is even possible that the hemorrhage may be due to active hyperæmia of the uterine mucosa, and not to rupture of the placental connections. This consideration gives warrant for temporizing, or what some of our late therapeu-

tic leaders would call "armed expectancy." "Time, rest, and opium," says the American editor of Churchill's "Midwifery." Rest, which is indicated in all kinds of hemorrhage, is especially needful in puerperal forms, for reasons which are sufficiently obvious; and opium to calm nervous excitement and lessen uterine action is indispensable; ergot is hardly admissible on account of its ecbolic action.

I am sure that I have more than once seen hemorrhage checked, and the woman enabled to go on to her full time, by putting the patient to bed on the supervention of a not very profuse flowing, giving 25 drops of laudanum, and applying cloths wrung out of ice-water to the vulva and pubes. It is, however, seldom that one is so fortunate. The flowing is a sign of irremediable separation of the placenta,—of death of the fœtus, of the fatal coming on of labor. When, then, the physician is convinced that all efforts to quiet uterine action and save the life of the fœtus are in vain, he will, if the hemorrhage continues, if the os and cervix be not open, plug the vagina and give ergot.

The method of tamponading which I have followed is that advocated by most obstetrical authorities. The patient is placed on her side or in the lithotomy position; a speculum (preferably a Sims) is introduced, and the vagina is thoroughly packed with pledgets of cotton; a string may be attached to these wads, kite-tail fashion, to facilitate extraction. It is, I think, a good plan to soak in strong vinegar the cotton pledgets that are to be applied to the os; some beneficial styptic effect is thus obtained. The vagina should not be merely filled, it should be thoroughly packed, or the tampon will do no good, and on arriving at the vulva, dry cotton wads should be inserted. A few compresses should be placed over this, and the whole kept firmly *in situ* by a T-bandage.

As for the material of the tampon, cotton-wool is probably the best. Dewes recommends a sponge. Siefort once snatched an apron from one of his nurses and crowded it into the vagina. On one occasion I used cotton cloth, torn into strips, and well packed into the vaginal culs-de-sac. Whatever substance may be used for tamponading, after twelve hours the plug should be removed, when the os will generally be found dilated and the fœtus in reach; at least, such has been my experience. With the extraction of the fœtus and placenta, all danger from hemorrhage is generally past.

In some cases it will be necessary to renew the tamponading, the vagina having been previously well washed out with a hot sublimate solution (hydrarg. chlorid. corrosiv., 1 part; water, 2000). If, after waiting another twelve hours, and removing the tampon, the ovum is still retained, and the patient is free from septic fever and alarming hemorrhage, what is to be done? It will be prudent to suspend all active interference, to give ergot, and await the expulsion of the fœtus by the uterine contractions. If, however, any urgency in the symptoms should contraindicate any such delay, forcible dilatation of the cervix should be effected, and the ovum extracted by digital manœuvres, if possible, or by blunt hook or forceps. In one instance, I was able to effect this extraction by the aid of a dull curette. The placenta will generally give the most trouble; the practitioner is seldom fortunate enough to get it away at one sweep with the ovum; it may remain behind on account of pretty firm attachment to the walls of the uterus. In such cases, I have frequently found it advisable to wait till, by the natural efforts, the after-birth had become separated from the uterus; intrauterine antiseptic carbolic or sublimate douches being frequently given to prevent septic accidents. In one instance, where septic absorption had really taken place, as evinced by chills and a temperature of 105° F., I was obliged to delay twenty-four hours before I could remove all the secundines. The uterus was douched every twelve hours with a two and a half per cent. carbolic solution (a Molesworth intrauterine syringe being used), and a 10-grain iodoform-pencil was carried after each douching up to the fundus and left there. The douche of itself has a powerful effect in aiding the removal of the secundines. It is needless to say that sometimes thorough artificial dilatation of the cervix, and the free use of the curette is indicated. This point has been much insisted upon by recent gynæcological writers, though I believe that the occasions are fewer where curetting is called for than some would lead us to think. It is really only exceptionally that the practitioner will feel himself obliged to use the curette in the treatment of abortion. By thorough antiseptic cleansings of the uterine cavity, and the use of iodoform-pencils, the case can generally be safely left to nature.

Before finishing what I have to say under this head, I must refer to several of the standard remedies in threatened abortion. One is venesection. This was advised by the old

authorities; Churchill recommends it. I am sure that plethoric cases, where blood-letting seems called for, or is justifiable, will be very few indeed.

Another prophylactic agent is *black haw*, the *Viburnum prunifolium*, in teaspoonful doses every two hours. Grandin, in Charpentier's "Obstetrics" (American edition), speaks favorably of this remedy. Bruce, in a communication to the Obstetrical Society of Edinburgh, extols chlorate of potassium in scruple doses *ter die:* and Picinilly is said to have known of several cases in which the chlorate has been successfully used with women who ordinarily failed to reach their full term.* Churchill recommends the tincture of Indian hemp, in 4- to 6-drop doses, every two, four, or six hours. It would, however, seem, from Dr. Christison's observations, that this drug is decidedly ecbolic in its action, increasing uterine contraction, and shortening the intervals between the pains.†

With regard to the use of cold applications externally in abortions, Lusk condemns them. Damp cloths and other cold applications over the abdomen are too depressing; besides, the blood is driven inward. Despite this fiat of so high an authority, many physicians will persist in having faith in ice and in ice-cold applications, the immediate effect of which is to contract the local blood-vessels and favor coagulation. I am sure that I have sometimes seemed to gain time—to promote the formation of clots in bleeding vessels, to markedly lessen the hemorrhage and the danger—by applying pieces of ice wrapped in a napkin to the vulva and lower part of the abdomen. The ice is kept constantly *in situ* for an hour or two: by that time the danger is often over.

As a substitute for the vaginal tampon, in grave cases of hemorrhage that cannot be controlled by rest, ergot, and external cold, Skene recommends tamponading the cervix uteri. He places a compress on the vulva, securing it by an ordinary T-bandage. If this fails to keep the bleeding within the bounds of safety, he then tampons the cervix. This is done, either by using a sponge tent, or by crowding an ordinary piece of sponge into the cervix with the uterine dressing-forceps. The hydrostatic dilators fulfil the indication even better still. The advantages of the cervical tampon over the vaginal, according to Dr. Skene, are these: the cervical can be introduced and removed through the speculum with the greatest facility, and without much pain to the patient. It more thoroughly controls the hemorrhage, and does not cause vesical and rectal tenesmus. It does not cause decomposition to the same extent. It helps to dilate the cervix, which is desirable; and by damming back the blood into the uterus, it separates the attachments of the fœtal membranes from the uterine walls. In using the hydrostatic dilator, the water in the dilator should be increased from time to time, so that it may rather more than keep pace with the dilatation of the cervix.‡

When the os is well dilated, a manipulation, first recommended by Hoening and endorsed by Dr. Paul F. Mundé (*Med. Record*, 1875, p. 87), is sometimes efficacious. Two fingers of one hand are introduced into the vagina, and passed as far up as possible into the fornix vaginæ; the other hand grasps the uterus through the abdominal parietes, and firmly compresses the organ between the fingers of both hands, slowly expelling its contents.

When the ovum and secundines are removed, all danger from hemorrhage may be considered as over. A hot sublimate douche (115° F.) may be indicated, both for a hæmostatic and antiseptic effect. I have generally found it necessary to administer such a vaginal douche night and morning for the first few days.

THE HEMORRHAGES OF PLACENTA PRÆVIA.

The following four cases of placenta prævia were furnished me by two leading physicians of Newburyport. In a practice of twenty-five years I have never been so unfortunate as to meet with a case. My experience in this respect has been like that of most of my colleagues in this city.

Case I. was communicated by Dr. J. J. Healy:

"Have had several severe cases in a practice of rather more than sixteen years. My average of obstetric cases for years has been fully two a week. Have been always successful in my cases of placenta prævia. The first thing to do when you are in presence of a patient who is flooding, in consequence of this puerperal anomaly, is to effect forcible delivery. If the os is not dilated, perform

* *Gaz. Mtd. de Paris*, December, 1874; *Med. Rec.*, April 17, 1875.

† Stillé's "Therapeutics and Materia Medica," article "Cannabis."

‡ *Medical Record*, January 16, 1875, p. 60.

manual dilatation, use Barnes's bags, anything that will enable you to get your hand into the womb; push to one side the placenta, or get your hand by it as best you can, find the feet, and perform version. My cases have all been treated in a manner very similar in detail to the following, which had some complications that were peculiar, and was certainly as desperate as any case with which I have had to deal.

"January 20, 1890, was summoned to attend Mrs. A. B., of Byfield, multipara, eight and a half months pregnant; was reported as not in labor, but as flooding. From 1 P.M. till my arrival at 4.30 P.M. had been flowing at intervals; the loss of blood was great; there were pools of blood on the floor, and the bedclothes were saturated.

"Mrs. B. had had several previous slight attacks of flowing.

"On making examination, I found the vagina full of clots. The os was dilated and dilatable. I removed all the clots; inserted two fingers into the os and cervix. I felt what seemed to be a large, firm clot, that I could not start. This I soon found to be the placenta, centrally implanted.

"The patient was nearly moribund from loss of blood; pulse small and filiform.

"On the right side I found the placenta partially detached from its site; I was enabled to insert my hand. The patient became violent and maniacal; I was obliged to desist, and to forcibly etherize her. Then I passed my hand into the uterus, and found the head presenting. I passed up my hand by the head, felt a foot, and brought it down; there was no difficulty in completing version, and delivering the woman of a dead child. Then I removed the placenta. The woman was cold and pulseless for two hours afterwards. I gave hypodermic injections of ether and brandy, and injected ergot; I also gave ergot by mouth. Finally, after I had given up all hope, the patient rallied, and made a slow but good recovery."

The three following cases were communicated by Dr. F. A. Howe, of this city.

"CASE I.—*Placenta Prævia; Central Implantation of Placenta; Hemorrhage; Tamponment of the Vagina, then Delivery by Version.*—Mrs. Geo. L.; second pregnancy; did not nurse first child. After first confinement menstruated once, at second month. At fifth month of gestation had a somewhat free flow. This did not occur again till about the sixth and a half month; was then very severe. By digital examination the placenta was found nearly central over the internal os. At the time of examination there was no flowing. Patient being quite a distance from me, I arranged that, on the recurrence of hemorrhage, Dr. Snow, who was near at hand, should be notified by the same messenger sent for me. Everything remained quiet for two weeks, and patient had rallied well. Suddenly, in the night, flowing returned. Dr. Snow was summoned, as arranged, and when I reached the patient half an hour later I found the vagina well tamponed, and no external flowing apparent. I removed the tampon, introduced my hand, separated the placenta, one edge of which was readily reached, ruptured the membranes, caught a foot, and easily turned and delivered a still-born child, the placenta following speedily, with comparatively little loss of blood. But a small amount of ether was given. Patient rallied fairly well for the time being, with no further bleeding, but died at the end of three weeks from general debility. There was no enlargement of the mammary glands; no secretion of milk. Had the patient completed her full term of pregnancy, the child would have been born eleven months after first confinement.

"CASE II.—*Placenta Prævia Centralis.*—Mrs. P. M.; Salisbury; patient of Dr. Dearborn; called in consultation; primipara; naturally of feeble constitution; seventh month of gestation; had had several slight hemorrhages; none serious till the early morning in consequence of which I was summoned. Found patient somewhat exsanguinous, pulse very feeble, and general exhaustion very grave. Examination revealed the placenta presenting in advance of the vertex; a margin of placenta was easily reached by the finger. A little ether, preceded by a full dose of brandy, was administered, and the os rapidly dilated, and a still-born child delivered by version. Placenta was at once detached, and prompt contraction of the womb secured. Very little blood was lost after the introduction of the hand for version, but patient survived only twenty-four hours. In this case, I think, the early loss of blood was greater than the attending physician was aware of, although the patient was very feeble during her entire gestation.

"CASE III.—*Central Implantation of Placenta; Hemorrhage at Seventh Month, rendering Patient Moribund; Delivery by Version; Recovery.*—Mrs. T., a poor, hard-working woman; multipara. A week prior to confinement had a few discharges of blood, last-

ing but a few minutes. When I saw her there was no flowing, and the general condition of patient was good. On examination, I found the placenta apparently centrally located over the os uteri. Enjoined absolute rest and nutritious diet, and requested to be summoned immediately (the patient lived very near my own residence) upon recurrence of bleeding. Four nights subsequently, in the midst of one of the severest rain and sleet storms I was ever obliged to face, the messenger came for me, and in a few moments I was at the bedside, to find my patient reduced to the last degree of exhaustion, and the bed full of blood. At the moment bleeding had ceased. While waiting for the patient to rally a little under the influence of active stimulants, by the mouth and hypodermically, a messenger was sent for Dr. H. F. Adams, who promptly responded. Meanwhile, no flowing had returned. Easily dilating the relaxed cervix, as I introduced my hand into the womb, the placenta escaped into the vagina. Delivery of a dead child by version was speedily accomplished, without much further loss of blood, although the patient was in a condition of alarming syncope. Besides hypodermic injections of brandy and ergot, freely administered by Dr. Adams, nitrite of amyl was given by inhalation with most gratifying results. Patient rallied slowly, and for several days remained in a critical condition, but finally made a good recovery, and is now in the enjoyment of robust health."

For the following case I am indebted to Dr. G. W. Jones, of Cambridgeport, Mass.:

"PLACENTA PRÆVIA PARTIALIS.

"On May 20, 1889, I was summoned to Mrs. P., a colored woman, aged 26 years, multipara, six and a half months advanced in pregnancy. The trouble was uterine hemorrhage, which had continued for ten days. It began by being very slight and unattended by pain; latterly the flowing had become profuse and alarming. At my first visit I found her very weak and exsanguinous, unable to sit up in bed for more than five or ten minutes at a time without fainting; pulse regular, but weak; temperature normal; appetite poor. Vaginal examination revealed the os uteri soft and somewhat dilated; the finger-tip could be inserted into it; the left side of os and body of uterus had a very soft feel, while on the right side the uterus was hard and the os seemed to be stretching over some hard substance, evidently the fœtal head. Examination did not cause pain of any sort, but there was a steady oozing of blood, which was evidently draining away the life of my patient. I at once ordered tr. ferri chl., gtt. x; fluid extract of ergot, gtt. xxx; to be taken in water three times a day, the patient to continue in bed till I saw her again the next morning. On my next visit, I found the hemorrhage lessened; patient had rested well, and felt more encouraged. This improved condition continued for eight or nine days, when she informed me that the flowing had increased during the previous night, and that she had had some labor-pains. Examination showed the condition of the uterus before described, with the os a little more dilated. My finger could easily enter the internal os, where I detected the fœtal head pressed against the right side of the os; while on the left was the ragged edge and surface of the placenta, which was beginning to become detached; I could distinctly feel the fœtal head through it. Instantly recognizing the difficulty of the case I had to deal with, I tamponed the vagina to its fullest capacity, and ordered perfect rest and quiet. I did not remove the tampon for forty-eight hours, there being no appearance of hemorrhage; but on the morning of May 31, the eleventh day of my attendance, she complained of regular labor-pains, and, on removing the tampon, severe hemorrhage occurred, and the os uteri being dilated, so that I could introduce my two fingers, I resolved on speedy delivery. After some little difficulty I brought a foot down, and hurried the labor through as speedily as possible. In less than half an hour I had delivered the woman of the fœtus and placenta; the placenta was found to be attached near the left margin of the os uteri, with perhaps about half an inch covering the os internum, where the hemorrhage took place. The fœtus was evidently at about the seventh month of intrauterine life, and was a monstrosity, and lived for about half an hour. The after treatment did not differ essentially from that of an ordinary labor case, and the patient made a good recovery."

The method of treatment of placenta prævia most approved at the present day, as being the most rational, and saving far oftener the life of the mother and the child than the older methods, is that advocated by Braxton Hicks and Richard Lomer, and popularized by the latter in an article in the *American Journal of Obstetrics*, December, 1884. Hicks first recommended the combined external and internal mode of version,

which does not require that the whole hand shall be introduced into the uterus in the case of only partially dilated cervix, but only two fingers, the fœtus being so manipulated by one hand over the mother's abdomen as to be brought within the control of the accoucheur's other hand. Lomer endorses the method with additions of his own, and insists especially on the necessity of the utmost slowness and gentleness in making the tractions. The accoucheur, having got hold of one or both feet, should draw down during the pains. The hemorrhage can now be controlled, for the head and body of the child make the best possible tampon, and slow delivery prevents laceration of the cervix and perineum. Lomer does not think that it makes much difference, practically, whether the insertion of the placenta be central or lateral; in any event, it must be sufficiently separated from its attachments to allow two fingers or the whole hand to enter the uterus. In the case of cervical implantation, it may be necessary to perforate the placenta with the finger before version can be accomplished.

In case of rigidity of the os and cervix, Lomer favors the tampon as a preparatory measure, the vagina being thoroughly packed with charpie or wads of cotton, which may be left in from twelve to twenty-four hours. This tamponading will effectually control hemorrhage and give the os time to dilate.

There is a general consensus among all modern obstetricians that early delivery in placenta prævia (and the earlier the better after the diagnosis is made) is demanded. It is never best to let the woman go to her full term with the hope of saving both child and mother. It is not to be expected that many women will consent to artificial means for expediting delivery unless alarmed by flooding; but when hemorrhage sets in, there should be no more delay; the accoucheur should insist on conducting the case to a speedy termination.

ACCIDENTAL HEMORRHAGE.

I have never had but one serious case of accidental hemorrhage. One dark night in 1868 I was called into a country-place five miles from home to attend a French-Canadian woman, who was seized with hemorrhage when near her time of confinement. The history was this: She was drawing a pail of water from the well, when she missed her footing and fell heavily, striking her abdomen against the curb. She was immediately taken with flowing.

When I arrived at the house, I found Mrs. B. already weak from the loss of blood. The flow was almost constant, though somewhat kept in check by the supervention of pains. There was quite severe pain over the fundus uteri on the right side. The os was still rigid, though beginning to dilate. With some difficulty I made out a head presentation; the existence of placenta prævia was excluded.

Finding that I could not at present effect delivery, I gave 60 drops of laudanum, and packed the vagina with cotton batting. This only temporarily controlled the bleeding, and in an hour I removed the tampon, with disgust at the result. The os and cervix had, however, become much softened, and were now dilatable. I ruptured the bag of waters, and found the head engaging in the os, but above the pelvis. Gave chloroform, and endeavored to apply long forceps. I could get the forceps on and make them lock, but they would not hold, slipping when any considerable traction was made. I then laid the forceps aside, introduced my hand into the uterus, passing by the presenting head, found a foot, and turned. There was but little more hemorrhage, for I soon delivered the woman of a dead child, and the after-birth followed in a few minutes. The uterus contracted well under external pressure and ergot, and the patient made a good recovery.

POST-PARTUM HEMORRHAGES.

Post-partum hemorrhages from retained placenta are, and ought to be, rare. The accoucheur waits a reasonable time,—fifteen minutes or half an hour. If the uterus does not of itself expel the placenta, he extracts it by Credé's method, or some modification of that method. I have generally found that firm grasping of the uterus through the abdomen and kneading with the fingers, while with the other hand gentle traction is made on the cord, is sufficient. In case of rather profuse flooding, Credé's method, in all its essential details, should be resorted to. Unless there are adhesions, the after-birth is easily delivered in this way, and firm uterine contraction obtained. In the event of adhesions, the case may present a serious aspect. I have in my lifetime met with only two instances of what might properly be called adherent placenta. In one, the adhesions were only partial. I easily removed with the fingers (the whole hand being introduced into the womb) the greater portion of the placenta, but certain cotyledons belonging to the

central portion remained behind. The uterus was kept aseptic by suitable injections, and ergot was given. On the third day the remainder of the placental mass was expelled. In the other case, which happened twenty-two years ago, the whole placenta seemed attached as by fibrous bands, and I was unable to remove any portion of it. Masses eventually separated, sloughed off, and were expelled with clots; the putridity was excessive, and it is hardly necessary to say that the patient died from septicæmia.

POST PARTUM HEMORRHAGE FROM INERTIA OF THE UTERUS.

Under this head is included hemorrhage taking place after the placenta has been delivered. A considerable excess of flowing is not an uncommon thing, nor is this to be wondered at when we think of the extent of surface from which the placenta has just been torn by the uterine contractions, and the more or less patulous uterine sinuses. A good precautionary means, on which most obstetricians now insist, is the administration of a full dose of ergot just before the birth of the child. Some accoucheurs make a practice of standing over the patient, the left hand grasping the uterus through the abdominal walls, and keeping up firm compression, with frictions and kneading, for an hour, or even more. This practice, which is a good one in some cases, is really seldom necessary. A healthy woman, who has not been exhausted by her labor, will not be likely to flow too much. "The torn arterial twigs," says Lusk, "retract spontaneously, the patulous mouths of the veins become plugged with fibrinous clots, while the so-called venous sinuses, which are simply channels lined with endothelium, without valves or walls, become bent, flattened, and obliterated under the compression exerted by the muscular structures of the uterus." Sometimes, however, when we little expect it, the alarm comes, "Oh, doctor, I am flowing dreadfully!" Then is the time for prompt action. The head of the patient is to be lowered, and the foot of the bed to be raised. A hypodermic injection of fluid extract of ergot must be administered, and repeated in ten minutes. The uterus and vagina must be cleared of clots, and hot water—as hot as can be borne: 115° to 120° F.—must be injected into the uterine cavity. There is no fear of doing harm by intrauterine injections at these times, for the water will readily run back through the patulous os. Where a fountain syringe has not been at hand, I have frequently used the Davidson syringe with the long canula. It is well to have the terminal end closed, though I have not always taken even this precaution. Vinegar is a good styptic with which to medicate the water, and is generally at hand; use equal parts of strong vinegar and water. Playfair, Barnes, Chambers, Atthill, Steele, and others, recommend the perchloride of iron; three fluidounces of the tinctura ferri muriatis to a pint of water is Steele's formula.* On the other hand, writers have pointed out the dangers attending perchloride of iron injections, and Beck declares in the *Obstetrical Journal*, February, 1874, that he has known death to attend their use. Dr. Grailly Hewitt, during the discussion of Beck's paper at the Obstetrical Society, referred to a case in his own practice where death had followed the perchloride injection, probably from absorption of the styptic and consequent blood-poisoning. He prefers vinegar, 1 part to 2 or 3 of water, which, he thinks, can never be harmful. I believe that the use of the perchloride injections is to-day generally abandoned; at least, in this country.

Whether the water be medicated or not, a considerable quantity should be injected. In order fully to control the hemorrhage, it may be necessary to inject several gallons. Place the patient cross-wise in bed, with the hips drawn well over the edge. A rubber sheet under her protects the clothing and the bed, and conducts the water into a pail below. The water should be as hot as can comfortably be borne—115° to 118° F.—when poured into the fountain-bag. Dr. Fordyce Barker affirms that this treatment will always "positively, absolutely, and efficiently control uterine hemorrhage." His experience coincides with that of multitudes in the profession, who now rely on the hot-water injections. †

* Braithwaite's "Retrospect," Part LXVIII. pp. 229–235; Charpentier's "Obstetrics," Am. ed., p. 236; also Braithwaite, Part LXI. p. 201.

† In some hospitals (notably the Women's Hospital, Philadelphia) a Davidson's syringe is used in preference to a fountain syringe, "as an intermittent stream has been found more effectual in exciting contractions than a continuous stream." The canula is introduced to the fundus. The douche must be used at least twenty minutes at a time, and the water kept hot by continued addition of fresh supplies. The patient should be always on her back, with her hips higher than the rest of her body; the vagina thus keeps filled. (See a valuable article by Dr. Clifton Wing in the *Boston Medical and Surgical Journal*, June 17, 1880.)

The fear which the older obstetricians manifested in

Nevertheless, there are many who still pin their faith on cold applications,—ice over the pubes, ice in the vagina.* I recall to mind a very severe case that occurred in my practice in 1867; this was before the hot-water treatment had come into vogue. I was a long distance from my home, in the country; the patient was a multipara. After a somewhat tedious labor, marked by uterine inertia, I delivered the woman with forceps, under chloroform. The placenta was extracted without difficulty. There was at first but little flowing, and I was soon in my carriage on my way home, when I was called back on account of the supervention of flooding. I found the patient blanched and almost pulseless; the bedclothes were drenched with blood; blood was also standing in pools on the floor. I placed my hand over the abdomen and grasped the uterus; it was large, loose, and flabby. I injected ergot and kneaded the uterus; the hemorrhage continued. I poured cold water from a height upon the patient's abdomen, the left hand still grasping the uterus. This produced a shock, which at once contracted the womb and arrested the bleeding. When I ceased pouring the water, the hemorrhage returned. I was obliged to keep up this cold douching for more than hour; two men were constantly employed in bringing water from the nearest well, which was two hundred yards distant. I gave at the same time whiskey freely, several times injected ergot, and kept my patient covered with dry blankets everywhere except over the abdomen.† I believe that to this heroic treatment this woman owed her life, though, doubtless, the hot-water treatment, if I had known of it, would have been even more prompt and efficacious.

Faradization is an excellent means for arresting post-partum hemorrhage, when due to inertia of the uterus. Unfortunately, one does not always have a battery at hand. The little pocket Gaiffe battery answers a very good purpose. One electrode (an olive-shaped bulb) should be inserted within the uterus, and the other should be firmly pressed upon the fundus over the abdomen. A pretty strong current should be used. "The experiments of Radford, Robert Barnes, and Mackenzie demonstrate that under its power the uterus can be made to contract, even when it resists the influence of what may be called the diastaltic remedies."‡

A recent editorial in the *London Lancet* (January 25, 1890) calls attention to Dr. Dührssen's "practically new treatment for atonic post-partum hemorrhage."§ It consists in tamponing the cavity of the uterus. "The cervix is seized with one or two volsellæ and drawn down to the vulva, or the plugging may be done through a duck-bill speculum. The end of a gauze bandage is then seized with a long speculum forceps, the left hand grasps the fundus uteri, and the end of the bandage is carried up to the fundus; the bandage [which is a continuous one] is then packed into the uterus bit by bit. The vagina is next packed in a similar manner, or, if there is cervical bleeding, with tampons of cotton-wool. Care must be taken that the packing material is not defiled on its passage

reference to introducing the hand into the uterus for the purpose of arresting post-partum hemorrhage,—a practice which Dewes condemns as pernicious,—is hardly justifiable in these modern days of antiseptic midwifery, when the accoucheur is careful to render his hands thoroughly aseptic before attempting any obstetric manipulations.

* A writer in the *Medical Press* has recently called attention to the danger of ice in post-partum hemorrhage, as several cases in which the hemorrhage was checked by the introduction of pieces of ice into the uterus have been followed by symptoms of septicæmia. This fact, he says, taken in connection with the recent researches of Prudden as to the presence of living bacteria in ice, may, perhaps, point to direct septic infection from the use of ice.

The best *preventive* of post-partum hemorrhage, according to Jaggard, is to secure retraction of the uterus by keeping the hand on the fundus uteri from the moment the child begins to pass through the vulvar outlet until the muscular fibres have rearranged themselves,—about one hour after expulsion of the placenta.—*Transactions International Congress of Medicine*, September, 1887.

† In this connection, attention may appropriately be called to papers read before the American Gynæcological Society in 1878 by Drs. Wilson, of Baltimore, and Penrose, of Philadelphia, on the treatment of post-partum hemorrhage. The former recommended the use of the hand as a curette to scrape the surface from which the placenta had been detached, and the latter the introduction of common vinegar into the cavity of the uterus on a piece of soft sponge or rag. At the stated meeting of the New York Academy of Medicine, February 5, 1880, Dr. Isaac E. Taylor advocated flagellation of the child's back previous to its entire delivery, as a means of preventing uterine hemorrhage, and flagellation of the abdomen of the woman after delivery of the placenta as a substitute for the introduction of the hand into the cavity of the uterus. The flagellation of the child consisted in quick, not harsh, blows with the hand over the child's back after delivery of the shoulders; and flagellation of the mother was performed after delivery of the placenta by powerful and frequently repeated strokes over the exposed abdomen with a towel doubled and the ends held in the hand, the doubled end being wet in ice-water.

‡ Charpentier, *loc. cit.*, vol. iii. p. 237.

§ *Volkmann's Sammlung Klin. Vorträge*, No. 347, 1889.

into the uterus; for, in the only fatal case from sepsis, the gauze bandage [which had previously been soaked in boiling-water] had been allowed to trail on the floor."

The best material "is a long, gauze bandage sterilized and soaked in five per cent. carbolic solution, or iodoform gauze; and, in default of this, strips of linen, sterilized as above, the vagina being packed with iodoform or salicylic wool." The plug is left *in situ* not longer than eight hours. Dr. Dührssen's cases are twenty-nine in number, many of which were exceedingly grave; there were six deaths, one from sepsis.

SECONDARY HEMORRHAGES.

These hemorrhages occur after delivery of the placenta and during the period of convalescence. They may be due to retention, through carelessness, of portions of the secundines; to laceration of the cervix (a severe case that occurred under my observation was of this kind); to a separation of thrombi at the placental site, or to a subinvolution. The latter is oftener the true cause.

In the treatment of these hemorrhages absolute rest in bed must be enjoined, and a thorough exploration of the uterine cavity should be made, and any foreign substance (polyp, shred of membrane, fibrinous clot, etc.) removed by the curette. The endometrium should be thoroughly cleansed by a hot-water injection, and medicated with Churchill's tincture of iodine, applied on a cotton-wrapped applicator. Any laceration of the cervix should be treated, if possible, by Emmet's method. Grandin advises argent. nit., ʒi to the ʒi to the erosion.* Ergot internally, with electricity and the daily use of the hot douche, will be required.

Mundé,† in a review of the causes of secondary hemorrhages, enumerates certain rare causes, such as hemophilia, functional disease of the liver, malarial poisoning, and disease of the endometrium. Here etiological considerations alone will suggest the appropriate treatment.

I have seen bad cases of secondary hemorrhage as the result of allowing the lying-in woman to sit up too soon after confinement. Rest in bed, with hot douches, and ergot and hydrastis (20 drops each of the fluid extract of ergot and tincture of hydrastis Canadensis three times a day) have been all the treatment required.

In two instances, I have known the heavy, flabby uterus to retrovert after parturition; this accident happened to the patient when sitting at stool. Severe flooding came on, which only ceased on reposition of the womb and the insertion of a Thomas pessary.

A CASE OF ACETANILIDE-POISONING.

By S. T. Armstrong, M.D., Ph.D.,
New Orleans, La.‡

WHILE it has been the experience of most physicians that have used acetanilide in their practice, that different individuals were differently affected by the same dose of that drug, yet, aside from the peculiar pallor, cyanosis of the lips, and occasionally a "sinking feeling," in some susceptible persons, toxic effects have been but rarely met with, or, if met with, have not been recorded.

I am familiar with but two cases of acetanilide-poisoning. The first, a case of Dr. Marechaux, reported in the Therapeutic Gazette of December, 1889, in which almost 4 grains of acetanilide were given by mistake to a child 5 months old. In two hours and a half the child was insensible, the eyes turned up, the skin blue. Pupils did not react to light; respiration superficial,—72; pulse imperceptible,—160 per minute; skin cold. A teaspoonful of Hungarian wine was given every hour, and the body was wrapped in a damp woollen cloth to favor perspiration. There was no retention of urine nor vomiting, and in twenty-four hours the child was well.

A second case is reported by Messrs. T. Jessopp Bokenham and E. Lloyd Jones in the *British Medical Journal*, February 8, 1890. A lady, aged 43, subject to migraine, was given monobromacetanilide .25 gramme (4 grs.) at 10.30 A.M., and the dose repeated at eleven because the headache had not improved. Her lips were then a little blue; but, as the headache did not improve, she took acetanilide, .5 gramme (7½ grs.), at 11.30 A.M., 12.15 P.M., and 1 P.M. She had a good appetite for lunch, was very much cyanosed, and felt "almost intoxicated and very giddy." She took some whiskey and lay down; her headache was worse; she had a sensation of suffocation; a pain started from the cardiac region to the left shoulder, and she lost consciousness. At five o'clock the pulse was 108, respirations 24,

* Charpentier, *loc. cit.* vol. iii. p. 248.

† Cited by Grandin in Charpentier.

‡ United States Marine Hospital Service.

temperature 99° F.; mental condition good. At 7 P.M. nitroglycerin, $\frac{1}{100}$ grain, was given, and the cyanosis increased. Alcohol, strychnine, and digitalis were then given, and the cyanosis diminished. Urine remained normal, and the patient was well in twenty-four hours. In this case thirty grains of acetanilide and its compound were taken.

The case that came under my observation was at the Lakeside Hospital, Cleveland, O. A healthy young seaman, aged 28, had been treated for hypertrophy of inguinal glands by extirpation. On November 25 he complained of pains in various portions of the body; and, as these increased in severity,—notwithstanding the fact that he was on antisyphilitic treatment,—on the morning of the 26th a prescription was written for antifebrin, ʒii, divided into eight powders, with directions that one powder should be taken every half hour until the headache, that was especially severe, ceased. While this was a careless way to write a prescription for this drug, it was expected that one, or, at least, two powders would afford relief; and eight powders were ordered because it was surmised that they would have to be continued daily until the specific action of the antisyphilitic medicine was obtained.

The nurse faithfully followed the directions, and, as the headache did not cease, the powders were given until eight o'clock, when the last was taken. At this time he was seen at the evening visit of the externe; the patient's skin was cold and blue; there were general symptoms of collapse; he had vomited freely; and in attempting to arise from his bed, fell to the floor unconscious. There was but slight muscular control; the heart's action was very rapid, but the pulse was not taken. Hot bottles were applied to the feet and legs, and whiskey was given by the mouth during the night. He did not sleep during the night, and the nausea continued until the next morning.

At the time of my ward visit, on the morning of the 27th, the patient felt very weak, the skin was moist, temperature 100.2° F., and pulse 130, compressible; his respiration was normal; the lips were still cyanosed, and the skin had a corpse-like appearance. His urine was normal. Milk-punch was given during the day, and by evening the patient felt as well as usual.

It would be impossible to state how much of the one hundred and twenty grains of acetanilide was absorbed by the stomach; but it is regarded as more than probable that the last few powders remained in the stomach, and were vomited. None of the vomited matter was saved or examined except by the nurse; it contained some of the food the patient had eaten for dinner and supper.

THE USE OF SANTAL OIL.

A paper in the *Wiener Medizinische Blätter*, for February 13, 1890, calls attention to the fact that the efficacy of specimens of santal oil is largely dependent upon the origin of the oil, whether obtained from the sandal wood from Zanzibar, Java or Australia. The Chinese appear to have been the first to recognize the properties of santal oil in arresting gonorrhœa, and for a long time they have refused to make use of any specimens except those derived from sandal wood from Mysore: the Hindus likewise use the oil of the wood obtained from this locality, and a number of papers have recently been published which seem to indicate that the antiblenorrhœic properties of the oil from this source is especially marked. Dr. Handerson, as quoted by the *Wiener Medizinische Blätter*, has used oil from this source and has obtained success where copaiba balsam and cubebs were perfectly inefficacious. Dr. Durand has also obtained success from the oil of sandal wood, no unfavorable after effects appearing upon the digestible tract. Dr. Candmont regards the oil of santal from Mysore as the most active remedy in acute inflammation of the bladder and states that he has succeeded in curing acute cases of gonorrhœa in three days. Gipoulon also publishes notes of cases of acute nephritis, of congestion of the kidneys with consecutive hæmaturia, relieved by doses of santal oil. While finally Posner in an address before the Medical Society of Berlin called attention to the good effects which he had obtained from the use of santal oil in the treatment of chronic gonorrhœa. Nevertheless in all instances the results obtained were in proportion to the purity of the preparation. It may be given in doses of about 3 drops in capsules in acute gonorrhœa, eight to twelve being given in a day, though in other affections three to six capsules would be sufficient. It is worthy of note that treatment should not stop immediately after the cessation of the discharge but should be continued for some time subsequently.

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Leading Articles.

ANTISEPTIC SURGERY IN GENERAL PRACTICE.

TO those of us who live in large cities, the use of antiseptics, both at the time of operation and in the after dressing of the cases, is a comparatively easy matter, for the materials required are generally kept on hand, or can be obtained in a few minutes from the nearest druggist's shop; but, on the other hand, to the practitioner in the country districts who may be called to see an urgent case when miles away from his office, their employment is a much more difficult matter. But, in spite of the manifold difficulties to be overcome under such circumstances, the remarkable results obtained by adherence to the principles, if not to all the details, of the antiseptic method of wound treatment is often surprising.

The tendency of the antiseptic method of wound treatment has been decidedly to simplification, the cumbersome spray apparatus has been almost generally abandoned, the disagreeable and in some cases dangerous solutions of carbolic acid have been superseded by irrigation with a solution of the bichloride of mercury 1 to 1000 to 1 to 4000; the preparation of the gauze has been much simplified; the detail which has held its place most steadfastly is that of thorough drainage.

We do not propose to consider the numerous materials which have been advocated by different surgeons in the last few years as valuable antiseptics, among which may be mentioned Mr. Lister's last preparation,—the so-called double cyanide of mercury and zinc,—but merely call attention to the one which, from its general use and the excellence of the results following its employment, has stood the test of time; we refer to the bichloride of mercury, used in a solution in strength from 1 to 1000 to 1 to 4000.

Many improvements have also been made in the construction of surgical instruments, with a view to the ease with which they can be rendered perfectly aseptic; such as the solid metal instruments nickle-plated, or made with aluminium handles, which admits of the instruments being placed in boiling water before being used, a procedure which is destructive to the ordinary instruments with wooden or bone handles.

But this we do not consider a matter of vital importance, if the surgeon has in mind the guiding principle of antiseptic surgery, and sees that the instruments are thoroughly cleaned after each operation, and are placed for a short time in a 1 in 20 carbolic solution before being used. With such precautions with the ordinary wooden-handled instruments, we constantly see cases which have been operated upon run a perfectly aseptic course, provided the surgeon has been caretaking in the other details of the operation and after-dressing of the case. At the expense of repeating what is generally known to most of our readers, we will detail the steps of an operation, as generally followed at the present time, and will then describe some modifications of the procedure which may be required for various reasons.

The part to be subjected to operation should be rubbed over with cotton saturated with spirits of turpentine to remove any oily material from the skin, and the part should then be well scrubbed with soap and water, and after this washed with a solution of bichloride of mercury 1 to 2000, and should be covered with a towel wet with the same solution if the operation is not immediately undertaken.

The hands of the operator should be washed in the same manner with spirits of turpentine, soap and water, and the bichloride solution, care being taken to see

that the region of the nails is thoroughly cleansed, and they should be immersed in the bichloride solution for a few moments immediately before the operation is begun.

The instruments, if solid metal ones are used, should be placed in a tray, and covered with boiling water, and allowed to remain for a short time before being placed in a 1 in 20 carbolic acid solution; if wooden-handled instruments be used, the immersion in boiling water has to be omitted, and they are simply washed and placed in the carbolic solution, and allowed to remain for fifteen or twenty minutes before being used. The region of the proposed operation should be covered with towels or lint wrung out in bichloride solution, care being taken that too large a surface of the patient's body be not brought in contact with the wet towels. During the operation the wound should be frequently irrigated with the mercuric solution, and this should be made as warm as the hands of the operator can comfortably bear, as the risk of chilling the patient and increasing the shock is much diminished, for the use of antiseptics, in spite of its many advantages, has not diminished the shock of operations.

The operation being completed, any bleeding vessels are secured by catgut ligatures, either the chromicized ligatures or those prepared in the oil of juniper, which have been soaked in the bichloride solution for fifteen or twenty minutes before being used: these are cut short in the wound.

The wound is next irrigated with the bichloride solution, and one or more perforated rubber drainage-tubes are introduced to the bottom of the wound and brought out at its most dependent portion, and secured by means of safety-pins.

The edges of the wound should then be approximated by sutures, either of chromicized catgut, silk, or silver-wire, the sutures being soaked for a time in the mercuric solution before being used.

The cavity of the wound should next be flushed with the bichloride solution, introduced through the drainage-tube by means of a syringe, and the surface of the wound and adjacent skin should be washed with the same solution.

The line of the wound is then freely dusted with powdered iodoform. This detail many surgeons of experience omit, and they consider that iodoform possesses feeble antiseptic powers; but when moistened by the dressings, or by the serum from the wound, its use is certainly of advantage. A piece of protective cut a little larger than the wound is next dipped in the bichloride solution, and laid over it, and this is covered by a good-sized piece of bichloride or carbolized gauze composed of twelve or sixteen layers, soaked in a 1 in 2000 bichloride solution, and partially wrung out, and this in turn is covered by a large piece of dry gauze, of twelve or sixteen layers, covered by rubber tissue or mackintosh, or oiled-silk, or oiled-muslin: several layers of bichloride cotton are now applied over these dressings, and the whole dressing is held firmly in contact with the part by the application of a gauze bandage.

If there is no bleeding or leakage of serum through the dressing, and the patient's temperature is about normal, the dressings need not be disturbed for a week or ten days, and when they are removed, the surface of the wound should be irrigated with the bichloride solution. The cavity of the wound, if there be any, should be washed out through the drainage-tube, and the tube should then be removed or shortened, and the sutures should be removed if the wound is healed, or they may be allowed to remain until a subsequent dressing; the dressing should be reapplied in the same manner as at the primary dressing.

Although it is well to adhere to a system of operative detail and dressing, such as above given, yet it often happens that in certain emergencies the surgeon is not provided with the different dressings required, and under such circumstances he has to improvise dressings from the materials at hand, the use of which will often be followed by results in no way less satisfactory than those of the more elaborate method.

If the surgeon has with him the bichloride of mercury,—and since this material has been so conveniently put up in pellets almost every practitioner carries it with him,—he can make a solution of the required strength in a few moments.

The wound can then be irrigated with this solution, and, if catgut ligatures are not at hand, silk or linen thread may be soaked in the bichloride solution, first being thrown in boiling water for a few minutes; these may then be applied to the bleeding vessels and cut short in the wound, treated as catgut ligatures; horse-hair drains may be substituted for the rubber drainage-tubes, being first well washed and then soaked in the bichloride solution before being used.

Silk or linen sutures, which have been

washed as above described, may be used for the sutures to close the wound; and, if no prepared gauze be at hand, surgical lint or old muslin or linen which has first been soaked in boiling water, and then soaked for a few minutes in the bichloride solution may be employed, a number of layers being used, and this may be covered by a layer of oil-silk or waxed paper or ordinary brown paper, and the dressing may then be held in position by a muslin bandage.

In a case, for instance, of a compound fracture, and it is in such cases that the value of antiseptic dressings has been so markedly demonstrated, the results following their use have been a revelation to the surgeon, who remembers the course this class of injuries ran a few years ago. A wound of this nature is probably already infected by the dust of the atmosphere before the surgeon sees it; and if he has with him the means of preparing a solution of bichloride of mercury, he should remove any foreign matter and thoroughly irrigate the wound, reduce the fragments if there be displacement, provide for drainage, and apply some temporary dressing, such as above described, which may be retained for some hours, or even days, if the wound is running an aseptic course, until the materials for a more elaborate dressing are obtained. If the bichloride solution is wanting, the next best substitute is water which has been boiled, and it is to be used as warm as the hands of the surgeon can bear; this may be employed to irrigate the wound, and to soak the dressings which are to be used until a more permanent dressing is obtained. No judicious surgeon would think of waiting some hours to operate upon a case of strangulated hernia because he had not antiseptic solutions or dressings at hand, for in such cases time is so important an element of safety, that he would consult the best interests of his patient by an immediate operation, taking care to see that his hands and instruments were clean, and the wound was irrigated with boiled water and dressed as above described.

We cannot subscribe to the doctrine that unless we have the materials to use during the operation, and to apply a complete antiseptic dressing, we gain nothing, for by the use of such improvised dressings we have often seen such excellent results follow that we can only say, let the surgeon bear in mind the principle of the antiseptic method of wound treatment, and do the best with the materials at hand.

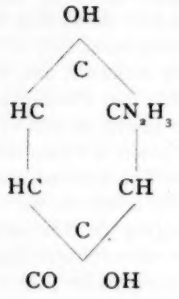
A NEW ANTIPYRETIC.

IT is very generally maintained that fever is dependent upon or, at any rate, associated with increased oxidation processes in the economy, and this hypothesis being admitted, the thought that some of the symptoms dependent upon the presence of fever would be most successfully treated by reducing agents is a natural consequence. More than this, examination of the modern synthetic antipyretics shows that they all contain an amide group combined with a larger and more complex molecule, and the supposition is again tenable that substances containing a double amide group, especially those in which the reducing power is highly developed, would likewise exercise a marked antipyretic effect. Unfortunately, however, most of the substances belonging to this category, such as hydrazin and its salts, although they possess extreme reducing power, are nevertheless extremely poisonous and especially destructive to the red blood corpuscles. This extreme toxicity of hydrazin and its salts has therefore prevented any effort to answer the question as to whether it possesses any antipyretic properties or not, and the attempt would, therefore, naturally suggest itself to combine hydrazin with the compounds which, while possessing antiseptic properties, are to a certain extent free from toxicity.

The first of these compounds which naturally suggests itself is phenylhydrazin, or a compound of hydrazin and carbolic acid, but unfortunately this has proved to be a powerful poison, splitting up the blood into its component parts, hydrazin and carbolic acid. Experiments with salts of this compound, such as hydrochlorate of phenylhydrazin, have nevertheless demonstrated the fact that they are possessed of marked antipyretic action, and experiments have, therefore, been made with the view of seeking compounds of hydrazin with more complex groups, such, for example, as occurs in acetyl-phenyl-hydrazin, which was first known as pyrodin, and later as hydracetin, and another substance known as antithermin; but even these, although possessing marked antipyretic properties, have nevertheless, in many instances, evoked serious symptoms as a consequence of the administration of comparatively small doses. Believing, however, that these experiments were made in the right direction, Professor Kobert has recently made a number of experiments, with the idea of replacing the poisonous phenyl group, as a compound with hydrazin, by the relatively

innocuous para-oxy-benzoic acid. With this object in view, therefore, Professor Kobert has made a number of experiments with a combination of hydrazin with para-oxy-benzoic acid, a compound which seems to be free from toxicity, and which the author describes under the name of orthin (*Deutsche Medizinische Wochenschrift*, 1890, No. 2, page 21).

The atomic organization of this body is represented by the formula



Orthin is an extremely unstable body, but the hydrochlorate of orthin, on the other hand, is a permanent compound, although even then the salt must be protected from light.

A freshly-prepared watery solution is colorless, and possesses extreme reducing power towards oxides of the heavy metals, immediately reducing Fehling's solution even in the cold. It also has considerable antiseptic powers. Professor Kobert has administered this substance to numerous animals, both warm-blooded and cold-blooded, and his results have shown that the hydrochlorate of orthin was not poisonous even in considerable doses; thus, 15 grains were given in one day to a dog weighing twenty-four pounds, and no anæmia, loss of appetite, or disturbance of the general health was to be detected. In all cases the urine of the animal acquired marked reducing power so that even in the cold it was able to reduce Fehling's solution.

The administration of 15 grains of the hydrochlorate of orthin to a goat was followed by the appearance of a considerable amount of sugar in the urine. Otherwise the animal seemed quite healthy and lost neither appetite nor liveliness. The reducing power of the urine was mainly due to a substance which could be removed by ether, but even afterwards a considerable quantity of grape-sugar remained which, however, did not ferment in the presence of orthin. Further, Kobert has found that in the proportion of 1 to 100,000 in the blood hydrochlorate of orthin produces marked vascular dilatation, but no alteration whatever occurs in the blood which can be detected by microscopic or spectroscopic examination, even when the proportion of the chlorohydrate is raised as high as 1 to 100,000.

At this point orthin was transferred by Professor Kobert to the hands of Professor Unvericht, who conducted a series of experiments in the hospital of the University of Dorpat with the object of determining the antipyretic value of this substance.

Although Kobert's experiments seem to show that orthin might be administered in doses sufficiently large to manifest marked reducing influence and that the effects might be retained for some time, clinical experiments by Professor Unvericht, reported in the same number of *Deutsche Med. Wochenschrift*, go far, however, to remove the sanguine expectations naturally occasioned by the reading of Professor Kobert's memoir. Professor Unvericht has found that the administration of the hydrochlorate of orthin in the dose of 7½ grains, whether in typhoid fever, acute rheumatism, pneumonia, or scurvy, while possessing antipyretic action it is yet extremely insufficient, the slight advantages following its administration being more than compensated by the extreme disadvantages which attend its use, such as profuse sweating, collapse, and sometimes more or less serious evidences of poisoning. The disheartening feature in the results obtained by Professor Unvericht are in the extreme variability of the results; for while in some cases 7½ grains were given without producing any effect whatever, in other cases 3 grains produced such marked depression as to indicate that the doses were very excessive, and comparatively small doses in several instances produced most remarkable and alarming oscillations of temperature. In two cases, through mistake in the administration of the remedy, 30 grains were given instead of 3 grains. In both cases there was severe vomiting, although antipyretic and other toxic effects were wanting, probably attributable to the fact that through emesis the economy was rapidly freed from the drug. Orthin was also tested as an analgesic in rheumatism and neuralgia, but was unsuccessful, in several cases marked chill following its administration. One case especially is worthy of notice, in which a medical student took only 1½ grains for neuralgia, the use of the remedy being rapidly followed by cold sweating, dizziness, and nausea. Externally the hydrochlorate of orthin was

tested as a remedy in psoriasis, but although it had the effect of softening the scales, it did not act as quickly or as efficaciously as chrysarobin.

It would thus seem that the results obtained from the experiments of Professors Kobert and Unvericht are practically negative as far as any valuable results have been obtained. They undoubtedly, however, indicate a movement in the right direction, and in any case a record of failure, when frankly related, is quite as instructive as a series of successes; at any rate, we can be sure that the statements of the authors are reliable,—a fact which too often admits of doubt when we read the enthusiastic eulogies which ordinarily attend the introduction of a new remedy.

In conclusion, we might mention that Dr. A. Heinz (*Berliner Klin. Wochenschrift*, No. 3, 1890) has tested the antipyretic value of several other derivatives of phenylhydrazin and finds that they all possess such toxicity as to unfit them for employment in therapeutics.

THE CUMULATIVE ACTION OF CERTAIN MEDICINES.

IT has long been known that certain medicines, after a more or less prolonged administration, may have a cumulative effect, and suddenly produce alarming symptoms. This is sometimes due to delay in absorption,—the medicines simply accumulate in some part of the digestive tube from lack of the proper conditions for absorption. There may, for instance, be a catarrhal state of the gastro-intestinal mucous membrane, or deficiency of the proper secretions by which the medicine is rendered soluble, till, with restoration *ad integrum* of the mucosa, absorption takes place, all the doses previously administered enter the circulation, and the organism is overwhelmed. Such a condition has been now and then witnessed when quinine pills have been given for malaria, solid opium in cholera, etc. Gubler calls this *accumulation of doses*.

The accumulation has been accounted for in some instances by arrest of excretion. The medicine has been absorbed, but it accumulates in the blood, owing to failure of the kidneys to eliminate it. The slowness with which, generally, medicines are eliminated when the kidneys are diseased—as in chronic interstitial nephritis—is well known; toxic phenomena may supervene more or less rapidly from this course. But, independently of disease, there are drugs which diminish urination by contracting the renal vessels; digitalin, according to Brunton and Power, has this property. This fact may explain some of the instances where a cumulative effect has followed the administration of digitalin. Strychnine has a similar action on the renal vessels (Lauder Brunton), and strychnine may almost be said to be the type of medicines that may become cumulative. That accumulation may come about in this way is rendered exceedingly probable by experiments of Claude Bernard and Hermann, who found that curare, which would not poison an animal when introduced into the stomach, owing to the rapid removal of this substance by the kidneys, would speedily paralyze when the kidneys were extirpated or the renal vessels tied.

The theory, then, is this: A certain quantity of an active medicinal substance, as strychnine, digitalin, represented, we will suppose, by 10, is daily taken into the system. We will suppose, moreover, that the dose, which may be regarded as the maximum of safety, is 50. Every day, then, an amount equal to 10 is absorbed and 5 eliminated, and by the eighth day the maximum dose consistent with safety will have been reached, and the medicine will so far have accumulated in the blood and nervous tissues as to produce its toxic effects.

This illustration, which is similar to one given by Gubler, may serve to explain some instances of cumulative action, but not all. Thus, it may explain why lead, arsenic, mercury, phosphorus, strychnine are cumulative, but it does not explain a peculiarity about digitalis, to which Gubler has called attention,—*i.e.*, the augmentation of the physiological phenomena of digitalism after suspension of the medicine. The tincture, powder, or infusion has been given for several successive days, with progressive slowing of the cardiac pulsations, and a more regular and forcible action of that organ. The administration of the medicine is stopped, with a pulse, we may suppose, down to 75 or 80. Now it will often happen that the fall of the pulse and other phenomena due to the drug will continue for several days, a week or more, causing more or less alarm. Quévenne (cited by Gubler) gives instances in his practice where this progressive slowing of the pulse continued from ten to fifteen days after discontinuance of the digitalis; and Durozier cites a case where the effect lasted twenty-five days.

Authorities (as Phillips) have denied the cumulative action of digitalis, and Gubler, when he wrote his "Commentaries on the Codex" (1872–74), was disposed to place little stress on this particular "inconvenience," which, he says, most observers have not noticed, and which, when noticed, "ought rather to be attributed to 'accumulation of doses,' the digitalis having been given in pill form." In his later "Therapeutic Lessons" and other works he acknowledges his mistake, and insists on what he designates as "accumulation of action," and this is substantially his explanation: Ordinarily accumulation of action is due to a certain fraction of the active substance being retained, day by day, in the parenchyma of the organ which it modifies, till the quantity exceeds the mean of safety. In the case of digitalis, it would seem that the active principles do not immediately penetrate the parenchyma, but remain in the lymph-spaces outside till a sufficient quantity has accumulated to have a real toxic effect when finally brought in contact with the ganglionic nerve-cells on which their specific action is naturally exercised.

It need hardly be added that this explanation, however plausible, is only a speculation, being unsupported by any direct proof.

THE EVILS OF HYPNOTISM.

PROFESSOR GERMAIN SÉE, in a recent series of lectures on "Sleep, Insomnia, and Somniferous Agents," has called attention to some of the evils which he thinks may be derived from hypnotic practices when employed for therapeutic ends. Hypnotism favors and develops tendencies to hysteria. Hysteria is a disease in which the higher cerebral activities are suspended; now this is a leading and essential characteristic of the hypnotic state. The Minister of War in France, in consequence of certain bad results, has forbidden military physicians to resort to hypnotism among the soldiers from fear that hysteria might be prevalent in the army. The same proscription, says Professor Sée, ought, with at least equal force, to apply to the practice of hypnotizing children, who may be made fools or crazy by the constant repetition of such practice. Gilles-de-la-Tourette declares that those that are hysterically predisposed are almost certainly made hysterical by frequent hypnotizing, and as for those already hysterical, if, by chance, one now and then succeeds in curing a paralysis or a contracture, it is only to make the disease locate itself elsewhere, or substitute for the contracture or paralysis a series of fits.

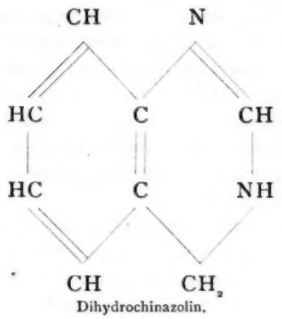
OREXIN, A NEW STOMACHIC.

STRANGE as it may seem, the last synthetical compound which has appeared as a candidate for a place in the Materia Medica is neither an antipyretic, nor a hypnotic, but is claimed to possess marked virtues as a stomachic and a stimulant to the appetite for which the name "orexin" has been proposed. The great majority of substances included in the group of stomachics are those to which the property has been attributed of stimulating the appetite, such as rhubarb in small doses, tincture of cinchona, condurango, and a host of the so-called simple bitters.

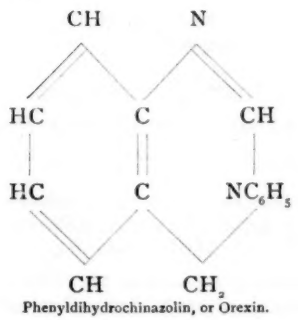
The opinion of physicians as to the worth of these substances in loss of appetite is a very different one, as might be readily seen from the difficulty of determining whether the effects noted after the administration of such a remedy are directly attributable to the drug or not; but it is generally admitted that in cases where the necessity for stimulating the appetite is most urgent all of these remedies have proved unreliable. That a substance may be regarded as a true stomachic it should possess not only the power of stimulating the appetite, but also the digestive functions of the stomach. Experimental investigation of the substances above-mentioned in this connection have yielded but uncertain results. The principal line of study has been directed towards determining the influence of bitters on the secretion of hydrochloric acid while any reduction of the time of digestion under their influence has failed of demonstration. Certain substances undoubtedly possess the property of reducing the sojourn of food in the stomach, such, for example, as the administration of hydrochloric acid in cases of dyspepsia, which are clearly attributable to reduction in the amount of gastric juice secretion. A true stomachic should then not only increase the appetite but also, and more particularly still, assist the functional activity of the stomach, and it is claimed by Professor Penzoldt (*Therapeutische Monatshefte*, February, 1890), that the hydrochlorate of phenyl-dihydro-chinazolin, or "orexin," is such a substance.

This body was prepared synthetically by Messrs. Paul and Busch, and is described (*Pharm. Journ. and Trans.*, March 1, 1890)

as being a derivative from chinazolin, a term applied to a compound represented by a structural formulæ differing from that of chinolin in having two CH groups of the naphthalin ring replaced by N instead of one. In dihydrochinazolin there is an imide group, the hydrogen of which is replaceable by an alkyl group, and it is the compound in which the substitution is effected by a phenyl group that is now put forward under the name "orexin."



Dihydrochinazolin.



Phenyldihydrochinazolin, or Orexin.

On account of its great solubility the author's experiments were made with the hydrochloride of this base, which occurs in colorless, crystalline needles containing two molecules of water of crystallization which is gradually given off in an excicator, the crystals becoming efflorescent; while the base is almost insoluble in water, this salt is readily soluble in hot water. It acts as a violent irritant to the nasal mucous membrane, and, placed upon the tongue, causes a bitter and intensely persistent burning taste. From a watery solution of the hydrochloride the base is separated by alkalies as an oily precipitate which afterwards crystallizes. Professor Penzoldt publishes notes of a number of experiments made by a student (Mr. Hoffman) as to the physiological action of this substance, and as to its influence on the blood and microorganisms, fuller details being promised in the publication of Mr. Hoffman's graduation thesis. Experiments on frogs show that doses of ½ to ⅓ of a grain produced death from motor paralysis, the paralysis apparently progressing from the periphery: while in warm-blooded animals "orexin" locally produces no inflammation or irritation either of the conjunctiva, the stomach, or cellular tissue. Subcutaneous doses given to rabbits of ¾ of a grain for every two pounds of body-weight produced no noteworthy symptoms, while, on the other hand, 4 grains caused marked toxic symptoms, consisting in tremor, clonic and tonic convulsions, dyspnœa, with retarded respiration, and accelerated pulsation of the heart, from which, however, animals fully recover in a few hours. In the dog, likewise, it produced vomiting. "Orexin" destroys the red-blood corpuscles and causes the appearance of the absorption band of methæmoglobin in the spectrum, while the blood itself becomes black in color.

These experimental results offer no indication as to the therapeutic applicability of this substance, though they teach that it is comparatively free from toxicity when given in moderate doses. In comparing the amounts given to a rabbit before symptoms of poisoning were produced, the inference seems warranted that it would require doses of 375 grains to poison a man.

Mr. Hoffman experimented on himself with gradually increasing doses, and found that it was not until doses of 15 grains were reached that there were slight nausea, dizziness, hotness of the head, and reddening of the face. On the other hand, he noted that in doses of 7½ grains there was astonishing increase in the appetite, and a constant feeling of hunger, so that the experimenter was led to eat more than double the amount he usually consumed. It was this result which led to the employment of the name "orexin" (ὄρεξις = the appetite.*) The author then instituted some experiments as to the influence of this substance on the duration of gastric digestion, and his experiments, which were made on a healthy individual, indicated that the administration of 4 grains of hydrochloride of "orexin" reduced the sojourn of white bread and meat in the stomach half an hour, while the hydrochloric acid, under the influence of this remedy in the digestion of beefsteak, appeared in the gastric juice one hour sooner

* Orexegen would etymologically appear to be a better name (ὄρεξις γεννάω = I generate), unless the author means that in giving "orexin" he gives appetite.

than when it had not been given. The results obtained in this individual were so striking that the experiment was repeated on other healthy individuals, with the same result,—namely, that "orexin" diminishes the duration of gastric digestion and leads to the earlier appearance of hydrochloric acid in the gastric juice, while further it leads to a great increase in the appetite. Seven and a half grains still further reduced the duration of gastric digestion (half an hour). Professor Penzoldt then proceeded to test the value of this substance as a stomachic in thirty-six clinical cases of the most varied character in which there was either loss of appetite or disturbance of digestion. In cases of severe gastric disturbance no experiments were made, as the author feared the irritating effects of the substance on the mucous membrane would increase inflammatory affections of the stomach. Its results, however, appear to be especially valuable in the combating of the loss of appetite which so often follows severe operative cases, in which the entire success of the operation is dependent upon the preservation of strength in the individual. So also in cases of pulmonary tuberculosis the appetite was greatly improved although no influence on the febrile processes was evident. In only five of the thirty-six cases experimented on by Professor Penzoldt was no effect noted, in five more the effect was uncertain, while in all the others it is claimed that the most surprising results were obtained. In a few cases the first dose was followed by an improvement of the appetite and digestive power, though the ordinary treatment which had preceded it had had no effect. That the results noted were really dependent upon the drug, and not coincidental, was determined by the return of the previous state of affairs when the remedy was suspended. One of the most striking results obtained by the author was the fact that patients in advanced stages of phthisis increased from six to seven pounds in weight in two or three weeks of this treatment. In but rare cases were any unfavorable after-effects noted. In a few instances there was a persistent burning sensation in the alimentary canal, although the author attributes this to the rupture of the capsule in which the drug was given. Vomiting followed in five cases, although it was then slight, and disappeared even during perseverance in the treatment. The method of administration was to make up thirty grains of orexin hydrochloride with extract of gentian and althea powder into twenty pills, which were gelatin-coated, 3 to 5 of these to be taken once or twice daily with a large glassful of meat-broth, a considerable quantity of liquid being required on account of the pungent properties of the compound. This method is stated to be preferable to the use of capsules, since the latter frequently become ruptured before entering the stomach and then produce a bitter taste and severe burning in the throat.

The author advises the administration of 3 of these pills early in the morning, and if no effect is noted the number may be increased to 4 or 5 or even repeated twice daily. If no effect is noted within four or five days this treatment should be stopped for three or four days and then continued.

The author's results are apparently especially worthy of attention since he writes that in no case were the patients informed as to the expected effect.

In conclusion, Professor Penzoldt especially cautions against expecting too much from this new remedy, although he seems confident that quite as successful results as he obtained may be expected from its administration. As to its mode of action no theories are suggested.

Reports on Therapeutic Progress.

THE SAFE PASSAGE OF A SHARP PIECE OF GLASS THROUGH THE DIGESTIVE TRACT.

In a recent number of the THERAPEUTIC GAZETTE we alluded to a method which had proved to be of service in the treatment of foreign bodies in the alimentary canal by restricting patients to an exclusive diet of potatoes. A case published by DR. WILLIAM H. FLINT in the *New York Medical Journal* for March 8, 1890, offers additional testimony as to the value of this procedure. The case was that of a young married woman, who accidentally swallowed a sharp piece of glass, which had been detached from a glass medicine tube, and had been swallowed before the patient could arrest its downward passage. The length of the fragment was about one-third of an inch and its breadth about an eighth of an inch. It was pointed at either extremity, and being a segment of a cylindrical tube, was convex on one side and concave on the other. From an examination of the line of fracture on the tube, the edges of the detached piece were judged to be very thin and sharp. The glass had not caused great dis-

comfort during the process of its deglutition, but had occasioned some pain referable to the soft palate and to the lower part of the pharynx. These parts were observed on the first examination to be incised and slightly bleeding, but the glass was not to be seen. A short time before Dr. Flint was summoned the patient had eaten a bowel of bread and milk, and five minutes before his arrival had taken a powerful emetic. After ascertaining that the glass was not within reach of the pharyngeal forceps, he passed a soft rubber stomach-tube into that viscus after obtunding the sensibility of the pharyngeal mucous membrane by spraying it with a two per cent. solution of cocaine hydrochlorate. No sooner had the tube entered the stomach than violent vomiting ensued. The major portion of the stomach's contents were thus evacuated into a jar, but no trace of the glass could be found. After this the stomach was washed out with quite warm water. There upon the tube was again passed, and the lavage again thoroughly executed, but without result. Neither did the eye of the tube, which was slowly withdrawn with a rotary motion, succeed in dislodging the glass. During the act of emesis the patient complined of a cutting sensation referred to the upper part of the œsophagus, and this feeling continued until about twenty-four hours after the glass was swallowed. Dr. Flint then concluded that the fragment was impacted in the œsophagus, and that it would be injudicious to use a probang lest this instrument should force the pointed glass through the œsophageal wall; therefore he ordered a glass of milk and Vichy water every two hours, a large baked potato with butter every four hours, and a half-cupful of flaxseed-tea every two hours, so arranging the doses of flaxseed-tea that they did not coincide with those of the milk and potatoes.

The patient suffered no inconvenience from her vitreous repast, except the slight œsophageal pain already alluded to, which, twenty-four hours after the glass was swallowed, was felt to change its position suddenly to a point lower in the œsophagus and then to disappear, leaving only a little soreness in its place. The same diet was continued, and in the evening, about thirty-six hours after the accident, 6 teaspoonfuls of castor oil were administered.

On the next morning there was an abundant fæcal dejection, which, however, contained no glass. The same treatment was, therefore, maintained, and a second dose of castor oil was given in the evening, about sixty hours after the glass was swallowed. During all that day there was no sensation, save that of slight tenderness in the stomach or the intestines.

On the morning seventy two hours after the accident, the bowels moved freely and painlessly. On examination of the dejecta, which were mostly solid and coherent, the glass was found, unbroken, and impacted in the centre of a fæcal mass of such firm consistence that considerable force was required to crush it and to liberate the fragment. Since then the patient has been perfectly well, and the slight wounds in the soft palate and in the pharynx healed quickly.

INJECTIONS IN ACUTE GONORRHŒA.

Dr. L. Friedheim, assistant in the clinic of Professor Neisser at Breslau, who has made a large number of observations with several drugs, such as zinc, lead, bismuth, tannin, various preparations of mercury, permanganate of potassium, creolin, etc., to test their astringent effect as well as their capacity for destroying gonococci, is equally dissatisfied with all the usual drugs. They all had either no permanent effect in destroying gonococci, or they irritated the mucous membrane to such an extent that their administration had to be stopped. Nitrate of silver alone acted quite satisfactorily. The author reports on three hundred and eighteen cases treated with this drug, two hundred and thirty-seven of which proved its antibacterial effect satisfactorily. Unfavorable results were chiefly obtained with out-patients who lived in unsatisfactory circumstances. The following is the *modus operandi* in Professor Neisser's clinic: Every acute gonorrhœa is immediately treated with an injection of nitrate of silver of the strength of from 1 in 4000 to 1 in 2000. The discharge generally increases at first, becoming thicker and more purulent, but very soon decreases and becomes thinner, whiter, and more epithelial. The gonococci decrease in a remarkably short time, and sometimes entirely disappear in a few days. The injections are first administered from four to six times a day, and are then reduced to one or two in the twenty-four hours, when at the same time a mild astringent like zinc or boracic acid is injected; but even after entire cessation of the discharge, the nitrate of silver is still injected once a day for many

weeks. The proper regimen must be followed for an equally long time. The injections are administered even when complications occur, especially epididymitis.—*Lancet*, February 15, 1890.

THE USE OF AIR IN THE EXAMINATION AND TREATMENT OF CAVITIES AND CANALS WITH THE AID OF REFLECTED LIGHT.

In the *New York Medical Journal*, for February 22, 1890, Dr. Franz Heuel, Jr., states that the disadvantages of the electric endoscope of Leiter, as regards the smallness of the field of vision, may be remedied by sealing hermetically the proximal end of a shortened canula and attaching to its side a fitting for a rubber tube, with bulb, to force in atmospheric air with which to dilate the urethra. He thus makes use of a speculum made of rubber, glass, or metal, shaped like a truncated cone, with the small end cut obliquely to facilitate its introduction into the urethra without the aid of a stylet. At the other or proximal end is a flange which is useful in separating the cover from the speculum. Into this end is closely fitted a movable cover having a transparent glass crystal, fitted air tight, and an attachment for a rubber tube with bulb. To prevent the glare of reflected light, the glass crystal is placed at an obtuse angle to the line of vision, and the inside of the instrument is blackened. After the canula is inserted into the meatus air is forced in by the rubber bulb until the requisite distention of the urethra is obtained. The entire canal to the neck of the bladder may thus be exposed and examined by the aid of reflected sun, gas, or electric light from a mirror on the forehead or in the hands of the surgeon. The air-pressure may be increased or diminished at pleasure while noting the effects upon the mucous membrane and studying every detail of its surface. By exercising a little care, no violence need be done to the delicate mucous membrane, as is very liable to happen with the Leiter canula, with which any sudden movement of the end of the tube against the engorged urethral wall, or even its introduction, usually produces hæmorrhage.

The author claims that by the use of his endescope the openings of the lacunæ, a drop of mucus or gleety discharge, the innumerable small blood-vessels, tumors, strictures, false passages, granulations, ulcerations, etc., may all be recognized and their characters and situations noted. Fragments of impacted or loose stone and foreign bodies may be dislodged without the aid of forceps by distending the canal with air and using gravity to propel the substance towards the meatus, where it may readily be seized and removed.

Dr. Heuel says there is no danger of forcing air into the bladder, and even should this occur he states that it will do no harm. As the urethra contains a good deal of moisture, which is liable to cloud the glass covering, he recommends coating the inner surface of the glass with a thin film of glycerine previous to the introduction of the speculum. This effectually prevents clouding of the glass without in any way obscuring the view.

Dr. Heuel is also adapting this endoscope to employment in the rectum, œsophagus, and stomach.

ANGINA PECTORIS IN THE HEART PALSY OF ACUTE SPECIFIC INFECTIVE DISEASE.

At the meeting of the Royal Academy of Medicine in Ireland, held January 24, 1890, Dr. J. W. Moore read a paper before the Section of Medicine, the object of which was to bring under notice a cause of the "breast pang" or angina pectoris, which seemed not to have attracted that attention to which it is entitled (*British Medical Journal*, February 15, 1890). This was the cardiac paralysis due to acute infective diseases, especially diphtheria. Within the past year three notable cases of heart failure in infective disease came under his observation. Of these the first and third were cases of diphtheria; the second was a case of septicæmia. The first showed no marked anginal symptoms; in the second and third these were present in an extreme degree. The conclusions arrived at were the following: 1. The group of symptoms described as "angina pectoris" might show themselves in the latter stages of any of the acute infective diseases, particularly septicæmia, or pyæmia, or diphtheria. 2. The anginal attacks of acute infective disease often answered the definition given by Dr. Byrom Bramwell of true angina pectoris,—namely, "a neurotic affection characterized by paroxysms of intense pain in the region of the heart, and a terrible sensation of impending death. . . . The affection is in many cases associated with organic disease of the heart and the root of the aorta, and in its typical and severe forms is apt to prove suddenly fatal." While drawing a clinical distinction between true angina pectoris—rarely met

with before the age of forty—and the pseudo-angina, or attacks of cardiac pain to which young persons were liable, Dr. Bramwell was careful to state "that the two forms run one into the other, and that it is sometimes difficult or impossible to separate them at the bedside." 3. These seizures of angina in infective disease appeared to arise in the following ways: *a.* Deficient innervation of the heart, or a true cardiac paralysis or heart palsy. *b.* A granulo-fatty degeneration of the heart muscle, the result of an acute parenchymatous myocarditis. *c.* A sudden increase of tension in the peripheral arteries, due to a cause acting upon the body from without, reacting upon an already weakened heart,—the *angina pectoris vaso-motoria* of Nothnagel. 4. Any one of these causes might operate singly in a given case, or two or more of them might be combined so as to determine an anginal attack. 5. Treatment was often attended by the happiest results in the angina of heart failure from infective diseases, the most useful therapeutical measures being,—1. In *a*, the administration of alcoholic and diffusible stimulants, the application of hot poultices over the heart, and of mustard epithems to the extremities. 2. In *b*, besides the foregoing, the administration of heart tonics and stimulants, such as nux vomica and strychnine, arsenic, digitalis, convallaria, and strophanthus. 3. In *c*, the administration of the nitrites, spirit of nitrous ether, nitrite of amyl, nitroglycerine, as well as iodide of ethyl, and such like remedies.

THE TREATMENT OF FEVER.

At the eighty-fourth annual meeting of the Medical Society of the State of New York, held February 4, 5, and 6, 1890, Dr. A. L. Loomis read a paper on this subject (*New York Medical Journal*, February 15, 1890). His remarks, he stated, were intented as suggestive rather than exhaustive. If fever was studied, either from a clinical or pathological stand-point, one soon became convinced that rise of body temperature or an increase or decrease in heat production and heat dissipation were only the appreciable expressions of those processes which attended and depended upon morbid changes in the blood and tissues of the body. These blood and tissue changes were expressed in temperature by a disturbance of the normal ratio between heat production and heat dissipation, and it, as well as the phenomena of fever, were only symptoms of such changes. The prominent factors which determined this ratio were: First, processes of oxidation, which resulted in the production of heat, urea, and carbonic acid. In the lighter degrees of fever the elements which underwent oxidation were mainly the excess of nutritive material in the blood, and also of heat stored in the cells. In the more severe forms of fever with higher temperatures, and even in prolonged fevers of low grade, the oxidation took place in the parenchymatous elements of the tissues, resulting in wasting and atrophy. A second factor was the vaso-motor control of the peripheral circulation. In the early stage of fever peripheral circulation was often decreased, and the surface radiation fell below normal. Subsequently vaso-motor dilatation allowed of free circulation and an increased radiation. Activity of the sweat glands was another factor which in some degree determined this ratio. Although heat radiation might be increased even when the skin was dry and the glands inactive, the decrease of surface temperature went on more rapidly when the surface was bathed in perspiration. The marked relief experienced by fever patients when sweating took place had suggested the presence of some other factor than evaporation and heat absorption, and had led to the belief that the febrile poison could be eliminated by a critical sweat. It was more probable that the sweating was the result rather than the cause of the febrile remission. Recent experiments had determined that heat production, as it depended upon oxidation in the tissues and glands, was regulated by a thermogenic centre. The exact position of this centre had not been definitely settled, but all investigators had agreed in placing it above the medulla, thus distinguishing it from the vaso-motor centre. The causes of fever, clinically, might be classed under two heads,—the nervous and the hæmic. Under the nervous might be included all those conditions which mechanically affected some portion of the nervous system unassociated with inflammatory changes. The hæmic included all those conditions in which irritating elements were known or supposed to be present in the blood. There were four classes of pyogenic elements which might be regarded as hæmic causes of fever. First, elements developed by perversion in the nutritive processes. This perversion might be in the primary digestion, in secondary metabolism, in retrograde changes, or in excretory functions, and resulted in the production of new and

the accumulation of normal poisonous elements in the blood. Second, leucomaïnes, or those poisons which were developed from inflammatory and exudative products. Third, ptomaïnes, or the bacterial elements with which they were associated. From recent studies of the subject, the ptomaïnes developed by bacterial growth had come to be regarded as the cause of infectious fevers, but the exact relation which bacteria and their ptomaïnes bore to the pathological changes of fever were not definitely determined. It seemed probable, however, that in most cases the ptomaïne was the active poison, although bacteria penetrated the tissues and were found in the blood and substance of organs. At present we were ignorant of the exact manner in which these poisonous elements excited these metabolic processes which were productive of fever. They might act directly upon the parenchymatous elements of tissues to increase metabolism, or, if all protoplasmic action was under the control of the nervous system, as some supposed, they might, by their actions on the thermogenic centres, either by stimulation or inhibition, excite those metabolic processes in the tissues which resulted in heat production. The general drift of opinion was towards the belief that the pyogenic elements acted primarily on such centres to produce fever. The question was now being asked if all fevers had not some form of infecting agent as their cause. The experiments of Dr. Roussy, of Paris, had demonstrated that many soluble ferments when introduced into the human organism determined a febrile condition. In all infectious fevers it was a well-established fact that the blood and tissues underwent certain characteristic changes. The fibrin and albumin factors were diminished, the white cells were increased, the corpuscles swollen, crenated, and often broken down. The parenchymatous elements throughout the body suffered varying degrees of cloudy swelling and fatty degeneration. Formerly all these changes were regarded as the direct result of high temperature. Recently it had been satisfactorily demonstrated that they occurred in fevers of low temperatures and that the parenchymatous changes depended upon diminished or perverted nutrition, the result of the excessive metabolism which caused the increased heat. The dangerous effects of high temperatures on the nervous system had, as it seemed, been overestimated. Although it had been determined, both by clinical observation and physiological experiment, that there was a point at which increase of body temperature caused collapse of nerve force and speedy death, such temperatures were seldom reached in fevers. Temperatures of 103° or 104° F. had come to occupy a position of secondary importance with most clinicians. Fever was regarded as a complex process, of which high temperature was a prominent, but not always the most important, feature. Our treatment of fever would vary with our views as to the dangers of high temperatures. Those who believed that all the grave symptoms of febrile conditions were referable to high temperatures would employ antipyretics early and persistently, while those who did not recognize any necessary relation between the temperature range and the other febrile symptoms would resort to these remedies less frequently. If high temperature ranges were readily reduced by mild antipyretic measures, the patient at the same time being much more comfortable, with a decrease in the nervous symptoms, they might be employed with advantage, but when powerful antipyretic remedies had but a temporary effect upon the temperature, and their use was followed by great nervous depression, they were better omitted. In a general way antipyretics might be divided into two classes, —the application of cold to the surface, and the internal administration of drugs. A cold bath would often produce a greater and more prolonged reduction of temperature than could be accounted for simply by heat abstraction. This sedative nervous effect was regarded as a far more valuable guide in their use than the effect upon the temperature range alone. When external abstraction of heat was followed by decrease of nervous irritability, as evidenced by decrease of muscular twitchings, cessation of delirium, or the advent of sleep after prolonged wakefulness, one might be assured that the applications were acting remedially, whatever might have been their effect on the temperature. When, on the other hand, the opposite conditions followed with evidences of nervous shock or irritation, no reduction of temperature which they might accomplish could justify the continuance of such measures. Unbiased investigation would justify the statement that while in particular instances cold baths might be advantageously employed for the palliation of certain conditions which we did not know how to abate in other ways, their routine adoption was to be deprecated. In the employment of cold in the antipyretic treatment

of fever it should be borne in mind that such treatment was usually directed against only one symptom,—high temperature,—and on this basis it should never be resorted to unless the temperature range had reached a dangerous point. A temperature of 104° F. might be regarded as the lowest danger point. If the object of its use was simply to abstract heat, cold should never be employed more severely than necessary to accomplish the desired result. For the past two years the speaker had used, in the treatment of typhoid fever, the cold coil to the abdomen, and had not found it necessary to resort to any of the more severe methods for temperature reduction. He believed that the early and constant use of the cold coil had kept the temperature below the danger point. If the only therapeutic effect of cold baths, employed according to Brandt's method, was the reduction of temperature, this could be successfully combated by other and less troublesome measures. If, on the other hand, the beneficial effect was due to the control which they exercised in the thermogenic and vasomotor centres, their employment must be advocated on an entirely different basis than the one usually advanced. Internal antipyretics included all those substances which had been found capable of reducing body temperature when taken into the system. It seemed probable that these remedies might be of two classes,—those which acted primarily on the thermogenic centres and those which neutralized or in some manner rendered inert pyogenic substances in the blood. Clinically, we knew that in different conditions different internal antipyretics had unequal therapeutic values. At present antipyrin, antifebrine, and phenacetin were the favorites in the specific fevers and conditions where nervous irritation was present and prominent. Quinine was preferable in malarial fevers and in surgical fever attended with suppuration, in septic conditions, or simple inflammatory fever. Salol and the salicylates were employed rather for their primary antiseptic action upon the intestinal contents and only secondarily as antipyretics. Opium and sedatives probably acted simply through their effect upon nervous irritation. It should be a rule never to give large doses of any internal antipyretic. The sudden reduction of temperature was liable to be followed by dangerous depression and collapse. Small doses frequently repeated accomplished all that was to be desired. Temperature reduction was not to be attempted unless it exceeded the danger-point. In all cases it was more important to watch the effects of antipyretics upon the heart and vaso-motor control of the circulation than upon the temperature range. When either were disturbed by their use they should be discontinued. If the destructive metamorphosis which took place in the tissues of the body in fever was due to the pyogenic substance which produced the fever, and not to the abnormal temperature, it became evident that our duty to the patient could not be discharged by the employment of any measure which was directed to the relief of only one of its symptoms. In the light of those recent experiments which demonstrated that the blood serum was the only operative germicide within the animal organism, and that its germicidal power was in proportion to its vitalizing power, we were forced to the position that in the treatment of all acute infectious diseases our successes would be in the judicious use of those measures which Dr. Chambers long ago designated as "restoratives."

THE EFFECT OF ANTIPYRIN ON THE SOLUBILITY OF CAFFEINE.

TANRET has shown that in adding to caffeine nearly its own weight of salicylate or benzoate of sodium the solubility of caffeine in water is greatly increased. In the *Répertoire de Pharmacie* for February 10, 1890, attention is called to the fact that antipyrin likewise possesses a similar property of increasing the solubility of the salts of quinine and likewise added to caffeine increases the solubility of the latter. It is claimed that it is only necessary to add to the caffeine an equal weight of antipyrin to render the former substance entirely soluble in cold water. With warm water it is claimed that it is possible to dissolve seven and one-half grains of caffeine in one hundred and sixty minims of distilled water by the addition of twelve grains of antipyrin, and that the solution so produced is permanently limpid. This increase of the solubility of caffeine by the addition of antipyrin greatly favors its subcutaneous administration, since through its aid fifteen grains of caffeine may be dissolved in three ounces of water, so that the use of caffeine in neuralgia or migraine will be greatly facilitated by the combination with it of antipyrin; further, the antipyrin may be expected, in these affections, to increase the probability of cure.

CYSTITIS IN THE FEMALE.

At the last annual meeting of the Medical Society of the State of New York, DR. ROBERT T. MORRIS read a paper entitled, "A Common but Rarely Described Form of Cystitis in Women" (*New York Medical Journal*, February 15, 1890). Dr. Morris stated that fissure of the neck of the bladder was apparently much more commonly met with than fissure of the anus, but was seldom recognized. The fissure could be seen by gently distending the urethra with proper specula, and throwing in light with a head mirror. It was a narrow, grayish ulcer, similar to a narrow aphthous spot in the mouth. The primary symptoms were pain on urination, lasting tenesmus after urination, and frequent urination. Secondarily came catarrhal cystitis and nervous derangements. The ulcer might be caused by the compression of folds of urethral mucous membrane by a uterus out of place, from a scratch by a passing bit of gravel, or it might be simply microbic, as the aphthæ of the mouth were now known to be. Treatment consisted in dilating the urethra slowly with the finger, to accomplish the same end as when we stretched the sphincter of the anus for fissure in that locality. Immediately after urination a few drops of a five per cent. cocaine solution injected at the neck of the bladder would at once control the painful tenesmus. The wool tampon for the vagina would give a feeling of great comfort and lessen tendency to spasm of the bladder. Absorbent cotton should never be used for the tampon, because when it became stony in a few hours it irritated the bladder just as it usually did the uterus.

The above treatment failing to cure, the bladder should be opened to give the urethra rest. This was best done by introducing a Sims uterine dilator through the urethra, pressing the bladder-wall backward, and then slipping a scalpel through the wall between the blades, entering from the vaginal surface. In one aggravated case recently he had opened the bladder above the pubes and poured into it, twice daily, an ounce of a mixture of boroglyceride and glycerin. Boroglyceride and glycerin was the best thing for any sort of hypertrophic catarrh. Clots in the bladder should be digested out with pepsin. If the bladder was acidulated with citric acid, pepsin would digest the thick tenacious muco-pus quickly, and give patients great relief. In old cases with contracted bladder, expansion daily with Davidson's syringe and warm boric-acid solution would gradually enable the bladder to hold a pint or more of urine. Skene and Emmet, in their latest works, had referred to this subject of fissure of the neck of the bladder; but English literature previously contained almost nothing on the subject, although the disease in question was commonly met with.

THE ACTION OF CAMPHORIC ACID ON THE NIGHT-SWEATS OF PHTHISIS.

DR. LEU (*Wiener Medizinische Blätter*, February 6, 1890) has tested the action of camphoric acid on the night-sweats of phthisis. This substance, which is produced by the oxidation of camphor by acid, is only slightly soluble in water, but quite soluble in alcohol. Although it has by no means an unpleasant taste, it is better given in capsules, although it is not certainly necessary. In the author's experience this remedy was given to thirteen different individuals, in fifty-five different doses, who suffered from night-sweats, in some cases to a very severe degree. Perfect success was reported as being obtained when there was perfect dryness of the skin, and this result was obtained in sixty per cent. of the cases treated. A partial success was obtained in only eighteen per cent. The average dose amounted to 30 grains of camphoric acid, although in some cases this dose was increased to 45 or even 75 grains, 35 to 45 grains being given in the evening and about 30 grains being given in the middle of the day. A remarkable fact was that sometimes the favorable influence of the camphoric acid was not noted until the evening after its administration, while, further, the good effects persisted for several successive evenings. In order to make a comparison with the remedies which possessed the greatest repute in the treatment of night-sweats, such as atropine, the author administered this remedy to six different cases in twenty-four instances, alternating each evening with camphoric acid. It appears from these experiments that perfect success was only obtained in forty-two per cent. of the cases treated with atropine, thus falling below camphoric acid in efficacy; while, further, even in the cases which were favorably influenced by the atropine, the permanence of the effect was not to be compared with camphoric acid. Moreover, all disagreeable after-effects, or secondary effects, from the administration of camphoric acid are quite insignificant,—a very different state of affairs from what fol-

lows the administration of atropine in physiological doses, such as dryness of the throat, loss of appetite, gastric disturbance, absolute dizziness, etc. Moreover, the author claims that the appetite and digestion are not influenced by the administration of camphoric acid. In some cases the patients attributed a certain amount of soporific effect to the action of camphoric acid, although this, perhaps, was attributable to the fact that the suppression of the sweat removed a cause which ordinarily would tend to disturb sleep. In one case there occurred an eruption, similar to urticaria, attended by severe itching, a few days after the administration of camphoric acid; but in spite of the continued administration of this drug it disappeared, so that it is extremely doubtful whether its appearance was merely a coincidence or whether it was attributable to the influence of the camphoric acid. The author has also made a number of experiments as to the effects produced by the external application of alcoholic solutions of camphoric acid. In one patient, who suffered from marked local sweatings, the substance was locally applied, and seemed to be extremely efficacious.

The author states that he is now occupied with experiments tending to test the activity of camphoric acid in sweating of the feet. According to the author's testimony it would appear that camphoric acid is worthy of further trial in the treatment of the night-sweats of phthisis.

NITRATE OF POTASSIUM FOR MALARIAL FEVERS.

In the *Virginia Medical Monthly* for February, 1890, DR. J. D. HUNTER claims that he has found that potassii nitras is an unusually effective agent in the treatment of chill and fever. He states that he has tested it thoroughly during the past five years, and claims that at least sixty-five per cent. of all the cases treated have been cured by the administration of a single dose, while the remaining thirty-five per cent. were uninfluenced by continued doses.

The best results were obtained when administered during the premonitory stage, which usually ushers in the chill. Twenty-five or thirty grains given at this period will either abort the chill or materially shorten its duration. The febrile stage is correspondingly shortened or reduced to a minimum. A second dose is seldom required; relapse is infrequent. Recent attacks, as well as protracted conditions, were alike cured by the administration of a single dose, while cases apparently similar, corresponding in character and duration, were not relieved. Other forms of intermittent, not associated with chill, were not benefited in a single instance.

Dr. Hunter writes that he has kept his cases under close observation, and that a number of his colleagues have likewise employed this salt, and their experience was identical with his as regards the unusual rapidity and permanence of cures. Their proportion of cures, however, he writes, did not quite equal his own.

Though the nitrate of potassium is recognized as a febrifuge, its use as an antiperiodic is to us a novel one. We trust that Dr. Hunter's experiments will be continued and reported on by others.

SODIUM CREOSOTINATE.

As far back as 1876 sodium creosotinate was recommended as an antipyretic, but it appears to have fallen into discredit on account of uncertainty of action. As the compound used was probably a varying mixture of the sodium salts of the three isomeric acids, derived from the corresponding cresol isomers, PROFESSOR DOMME instituted some comparative therapeutic experiments with the separated compounds (*Pharm. Zeit.*, January 29, p. 68). He reports that only the paracreosotinic acid is of use in medicine, the ortho and meta compounds proving one inactive and the other dangerous. Professor Loesch found that sodium paracreosotinate is well tolerated by adults in quantities reaching to 6 or 8 grammes (90 to 120 grs.) daily. A part of the compound appears to pass unaltered into the urine, which then gives a violet color with ferric chloride. Administered to children, it behaved as an active antipyretic in large doses, 1 gramme (15 grs.) having been giving to a child 12 years old within three hours. It is further stated that good results have been obtained with the salt in the treatment of acute gastro-intestinal catarrh in children. Sodium paracreosotinate is said to occur as a fine crystalline powder, with a distinctly bitter but not disagreeable taste. It dissolves in 24 parts of warm water, from which it does not separate on cooling. The free acid crystallizes from aqueous solutions in long shining needles; it melts at 151° C., and sublimes undecomposed. —*Pharmaceutical Journal and Transactions*, February 1, 1890.

TREATMENT OF CHRONIC DIARRHŒA.

In the *Boston Medical and Surgical Journal* for February 20, 1890, DR. H. F. VICKERY publishes a paper on the treatment of chronic diarrhœa, which, although it offers no claim for originality, yet calls attention to a number of points which are doubtless overlooked by the majority of practitioners. He shows that in the treatment of chronic diarrhœa four general principles should be attended to. *First*, the diseased parts should be given rest; *second*, any tendency to abnormal fermentation should be corrected; *third*, no fæcal accumulation should be permitted; *fourth*, pain should be relieved.

Taking these four indications in order, he shows that rest for the bowels means the ingestion of such kinds and amounts of food as will tax intestinal digestion least. Of course, it is not meant that the patient should be put on a starvation diet, for although this succeeds in acute diarrhœa, it is not so in chronic. The principle which Dr. Vickery recognizes, although he does not emphasize it, is that substances which are digested in the stomach are suitable in such cases, while those which are dependent upon intestinal digestion should be avoided. He therefore recommends meat-broths and aseptic milk, while oily bodies and starchy foods should be avoided.

In the second place, as the intestines, even in health, swarm with bacteria, and the natural processes of intestinal digestion border close on putrefaction, some antiseptic is almost always useful as an ingredient in the prescription for chronic diarrhœa. Subnitrate of bismuth probably acts to some extent in this way, besides soothing the mucous membrane. Michailoff, of St. Petersburg, has recently reported the cessation of a diarrhœa which had lasted thirty years under the employment of salicylate of bismuth. Dr. Vickery also used carbolic acid (½ grain in each dose), beta-naphthol (½ to 1 grain), and salol (2½ to 5 grains). Thymol has also been praised (2 grains three times a day), but in the one case which the author tried it he suspected it of causing headache, although the diarrhœa improved while it was being taken.

The danger from fæcal accumulation in chronic diarrhœa seems to be one which is rarely recognized, although Dr. Vickery states that the accumulation of fæcal masses may cause mischief. This undoubtedly would be true if it occurred, and although there may be, of course, a fluid discharge from the bowels, aud hard masses still remain in the intestine, such a state of affairs is of but exceptional occurrence, and its recognition and removal of the fæcal accumulations will in nearly all cases cure the affection.

This factor in the causation of diarrhœa is well worthy of attention, and a paper by DR. C. P. PUTNAM in the *Boston Medical and Surgical Journal* for March 6, 1890, especially emphasizes the importance of bearing in mind that in some cases retention of fæces may be an important element in rendering diarrhœa persistent. Of course, where the diarrhœa is known to be due to the presence of some offending substance, no one hesitates to administer a cathartic; thus castor oil, or rhubarb, or calomel are used frequently, and with much advantage, in diarrhœa from indigestion in children. Dr. Putnam refers to three typical cases, occurring in an infant, a young woman, and a youth, illustrating different evidences of diarrhœa being kept up by the retention of fæces.

The practice of giving opiates for diarrhœa, irrespective of its cause, is highly objectionable, and may be even dangerous. The number of discharges is of comparatively little importance, in offering indication as to the character of the treatment, as compared to their quality. Extremely offensive stools, as indicating a process of decomposition in the intestines, is to be regarded as an indication for the administration of a laxative, and it will be found that the administration in some cases of a few calomel powders will produce much more rapid and permanent improvement than the routine treatment with astringents and opiates.

Pain may be overcome by the use of a few drops of laudanum, or a drachm of paregoric, to each dose of medicine, omitting it as soon as may be. Sometimes the bowels are lame, so that motion is painful. Sometimes changes of temperature affect the patient disastrously. For both these conditions a flannel swathe is useful. And in severe cases, rest in bed is demanded.

Where the frequent dejection of small amounts of mucus and blood, with tenesmus, indicates the predominance of colitis, rectal irrigations through a soft tube passed high up are both rational and efficient. Two or three pints of simple cold water used in this way may do good. In it can be dissolved sulphate of zinc or alum to the amount of one grain to every four to six ounces of water; or two grains of nitrate of silver to a pint may be injected every one or two days, if allowed to come away at once.

POTASSIUM BROMIDE AS AN ANTIDOTE TO IODOFORM.

The poisonous after-action of chloroform, alluded to in a previous issue, is confirmed in the report of two cases in which the maintenance of chloroform narcosis for two hours, in a case of a man operated on for resection of cancer of the rectum, lead to the production of jaundice. The essential point of interest, however, in this case, which was reported by DR. J. SAMPER in the *Centralblatt für Klinische Medicin*, March 1, 1890, was that for four days there was marked iodism produced as a consequence of the absorption from iodoform dressings, the symptoms being greatly improved by the administration of bromide of potassium. The author apparently finds some connection between the jaundice produced by chloroform and the intolerance of iodoform, since he states that after the skin had regained its normal tint iodoform was then well tolerated. The author further explains the favorable effect produced in these cases by potassium bromide as due to its influence on free iodine, in which respect it is preferable to the ordinary antidotes, such as potassium bicarbonate, sodium chloride, or potassium acetate. Further, the sedative action on the nervous system in iodism is also worthy of therapeutic notice.

Finally, the author claims that potassium bromide may be used as a preventive of iodine-poisoning.

THE PHYSIOLOGICAL TREATMENT OF OBESITY.

At the meeting of the New York Academy of Medicine, held January 21, 1890, DR. WALTER MENDELSON read a paper of this title (*New York Medical Journal*, February 8, 1890).

In order to gain an intelligent insight into the nature of obesity it was necessary to have some idea of the laws relating to the processes of nutrition. Up to quite recent times it was the general belief that the oxygen taken into the blood from the inhaled air was the direct factor concerned in the many chemical decompositions going on in the body; and, in consonance with this view, it was held that fat accumulated from more of it being formed than the oxygen could consume, either excess of food-supply or deficiency of oxidation being ascribed as the causes of obesity. Simple and satisfactory as this hypothesis appeared, it was now relegated to the limbo of errors. The belief at present was now that all the metabolic phenomena of the economy had their seat in the cells, and that all cells had inherent power of splitting up relatively complex chemical compounds into bodies of simpler composition; and, while we are as yet unaware of the processes by which the cell effected these decompositions, we did know that the oxygen in the tissues was but indirectly concerned in them. Certain external agencies had the power of modifying the chemical powers of the cells. Among those that diminished might be mentioned quinine, alcohol, morphine, low temperature, and deficient food-supply, including insufficiency of oxygen; while excess of food-supply, the changes subsequent upon fever, high temperature, and muscular activity increased them. The disintegratibility of the different classes of foods brought to the cells varied widely, and the causes of obesity and its treatment on physiological grounds could only be fully understood when the differences were known and given their full value.

Experiments had shown that, of the three great classes of food,—the proteids, the carbohydrates, and the hydrocarbons,—the one most easily split up was that of the proteids. The carbohydrates were next in order, while the fats, or hydrocarbons, were the most resistant. If proteid food alone was ingested, the soluble albumen carried to the cells was there in part converted into the tissue-albumen of the organ formed of the cells, and in part changed into fat and other products,—all of which would tend to be split up into still simpler bodies until the power of the cells became exhausted. If, now, in addition to the proteids, fat was ingested, the decomposition of the proteids would go on as before, but the food-fat, being more readily oxidizable than the tissue-fat formed from the proteids, would shield the tissue-fat from destruction, and at the same time preserve the tissue-albumen from destruction as well. Thus, indirectly and in a double way, the food-fat led to a storing up of fat. By affording a more easily oxidizable substance for the liberation of energy than tissue-fat, and by preserving the tissue-albumen from destruction, there resulted greater chemical activity of the cells and a more active elaboration of the food-albumen. The result of this was both increased growth of the cells and increased manufacture and storage of fat made from the albumen brought to them. It had been determined that the following quantities of

the food classes were equivalents and isodynamic, and that, in their decomposition into carbonic acid and water, each yielded an equal quantity of energy, measured as heat: Fat, 100 grammes; albumen, 211 grammes; starch, 232 grammes; cane-sugar, 234 grammes; and glucose, 256 grammes.

From this it was apparent that an accumulation of fat would most readily occur when the diet contained an overplus of fat, because, while least in quantity, fat had the highest equivalent; next, when it contained an overplus of albumen, and lastly, of carbohydrates. After reviewing the chief factors concerned in the manufacture and deposition of fat in the body, Dr. Mendelson took up the methods to be adopted for preventing such accumulations. The aim was to make the production not exceed the consumption, and, where a surplus existed, consumption must for a time exceed production. In the great majority of cases ingestion of too great a quantity, or of an improper quality, of food, often combined with too little exercise, were the causes of obesity. It remained, therefore, to suitably regulate the diet and exercise. It should be borne in mind that the change we wished to bring about, to be beneficial, must be gradual; that the cells must be educated by degrees to the new duties we wished them to perform; that anything approaching starvation, like the Banting cure, was to be condemned. The diet should be principally albuminous and relatively little non-nitrogenous food. But we must always keep in mind that as the fat of the body became by this process gradually reduced, the diet must undergo a corresponding change, more and more of the non-nitrogenous foods being allowed as the body grew relatively richer in albumen and poorer in fat. Unless this was done a point would be reached where not only the fat of the body but the albumen as well would be consumed, and the patient, after feeding thus on his own muscular and glandular tissues, would begin to complain of weakness and lassitude. This, of course, was to be avoided by carefully regulating the diet; the patient must never feel worse, but always better under treatment. Dr. Mendelson had prepared a diet list which was to serve the patient as a general guide. No hard and fast rules could be laid down. Above all, one must never yield to the wishes of the patient to grow thin quickly. All reforms, to be lasting and beneficial, must be slow in their action; the growth must be from within, not alone an impress from without.

SYMPTOMS OF LESIONS OF THE SPINAL CORD.

A modification of the current views as the symptoms of complete transverse lesions of the spinal cord will be necessary after the masterly and convincing paper which was read by DR. BASTIAN at the meeting of the Royal Medical and Chirurgical Society on February 22 in support of his contention, expressed eight years ago, that in *complete* lesions of the spinal cord there is absence of the knee-jerks and other deep reflexes and flaccidity of the limbs, and not rigidity with increased reflexes as usually taught. In support of his contention he gave minute and accurate clinical records of four cases in which there was developed, under observation, complete transverse lesion of the spinal cord (in these cases due to extensive softening). At first the deep reflexes were exaggerated, but as the lesion became more and more complete, as shown by absolute motor and sensory paralysis, the deep reflexes entirely disappeared, and the limbs became completely flaccid. This condition of things continued until death, when the necropsies showed (at any rate in three cases) complete destruction of the cord at the level of the lesion. In these cases shock was out of the question, the lesion was in the upper part of the cord, and there was not the slightest evidence of any independent lesion in the lumbar enlargement. Dr. Bastian fortified his position by quoting nine cases of fracture-dislocation in the cervical and upper dorsal regions, in which flaccidity of the limbs and abolition of the reflexes were noted soon after the accident, and persisted until death occurred, in most cases weeks later, when all shock had long passed away. It is much to be regretted that fuller opportunities could not be afforded for discussing so important a communication; but in the brief discussion which followed on these points additional cases were quoted by Dr. Hughlings Jackson and Mr. Bowlby, completely confirming the views expressed in the paper. Dr. Bastian looks with suspicion on the cases which have been described as complete lesions due to compression of the cord in Pott's disease. A case will be found in our issue of February 22, in the report of the meeting of the Pathological Society, in which for twelve months before death there had been absolute paralysis of motion and sensation, but in which there was rigidity and increased reflexes. Here, to the naked eye, the disorganization of the cord at the level of the

lesion appeared to be complete; but careful examination by modern methods showed the existence of a considerable number of axis cylinders traversing this apparently disorganized portion of the cord, so that this case, and probably also those referred to by Dr. Buzzard in the discussion, would hardly come under the category of *complete* lesions to which Dr. Bastian's paper refers, and with regard to which he completely established his case.

Another point of interest from a clinical point of view was the different behavior of the superficial and deep reflexes. In all of Dr. Bastian's cases, after motility, sensibility, and deep reflexes were completely abolished, the plantar skin reflex persisted for a short time. Mr. Bowlby also had observed that in the cases of fracture-dislocation, some weeks after the accident the skin reflexes returned, while the deep reflexes remained absent until death. Of not less interest than these clinical observations were the remarks made by Dr. Bastian as to their bearing on the theories with regard to muscular tone and the deep reflexes. He held that these cases showed that the tone of the muscles and the presence of the knee-jerk depended on influences passing down from the encephalon, favoring these reflex phenomena. This influence was thirteen years ago attributed, on theoretical grounds, to the cerebellum by Dr. Hughlings Jackson, and to his view, with some modifications, Dr. Bastian adds his support. Dr. Jackson believes that the normal tone of the muscles is due to the balance of influences constantly passing down from the cerebrum and cerebellum, the former tending to diminish and the latter to increase the tonus of the muscles, and in this way accounts for the increased reflexes in cases of hemiplegia, the cerebral influence being cut off and the cerebellar influence no longer interfered with. There is evidence that this cerebral influence descends by the pyramidal tracts, and, assuming that these authors are correct in their views, it seems probable that the cerebellar influence descends in the gray matter. This is supported by the occurrence of increased reflexes in the cases of slow compression, where the gray matter is usually less damaged than the white, and by a case of Mr. Thorburn quoted by Dr. Bastian, in which there was hemorrhage almost confined to the gray matter in the cervical region, in which the absence of deep reflexes persisted, although the conducting functions of the white columns were to a considerable extent restored. Now that the matter has been so prominently brought before the profession, we may expect that facts will soon be forthcoming to settle definitely some of the disputed points to which we have referred.—*Lancet*, March 8, 1890.

THE PHYSIOLOGICAL AND THERAPEUTIC ACTION OF CREOSOTINIC ACID.

Paracreosotinate of sodium is a crystalline powder, of a bitter yet not decidedly unpleasant taste. It is soluble in 24 parts of warm water, without being deposited when cooled. According to the experiments of DEMME, made upon himself (*Wiener Medizinische Blätter*, February 20, 1870), doses of 45 to 60 grains produce no marked effect. About two hours after doses of 45 grains there is a feeling of great fulness of the blood-vessels of the skin, with light pulsation of the arteries, and moderate perspiration. The digestive functions are not, however, influenced. Twenty or thirty minutes after the administration of the remedy a chloride of iron reaction is obtainable from the urine, and the excretion does not disappear entirely until after twenty-four to thirty-six hours. The remedy so administered to children as an antipyretic in concentrated and in dilute solutions, with the addition of a little sugar and a few drops of brandy or fennel or licorice juice, is readily taken and well borne. The author claims that this solution, given in small doses, will often produce a favorable influence in cases of typhoid fever, especially diminishing the number and quality of the intestinal evacuations. Cases of fibrous lobular pneumonia pursue a perfectly normal course under its administration, while in catarrhal lobular pneumonia its administration appears to reduce the fever and to shorten the morbid processes.

In tubercular phthisis it will probably be found no better or no worse than many other antipyretics, reduction of temperature following the administration of a large single dose. Thus, 15 grains were given to a boy 12 years old as often as every five hours; 7½ to 15 grains were administered without producing any serious after-effect. The reduction of temperature amounted to about two degrees. In some cases marked collapse appeared, which was best combated by the administration of brandy and water. As is the case with so many other of the antipyretics of the series, creosotinate of sodium likewise produced an erythematous eruption.

In addition to reducing the temperature, it also slows the heart, while the tension of the blood-vessels is apparently increased, the pulse feels fuller, and the energy of the cardiac systole seems to be increased. The drug is well borne by the stomach and intestine. In its general effects the author compares this slowing with salicylate of sodium, since the effects produced by each are similar, and both are highly efficacious in the treatment of acute articular rheumatism.

BALSAM OF PERU IN PHTHISIS.

According to the Berlin correspondent of the *Medical Press and Circular*, March 5, 1890, DR. LANDERER has recently recommended the employment of balsam of Peru in a novel manner in the treatment of pulmonary phthisis. This was the intravenous injection of an emulsion of the balsam. The idea at the foundation of the recommendation was that the balsam reaching the blood-current would be deposited principally in the parts affected, and there set up an inflammation that would act as a barrier against the progress of the bacillary disease. The conception of introducing an insoluble substance into the blood-stream was a daring one, and practically it has not been acted on. DR. OPITZ, of Dresden, has more recently taken up the subject, and thinks he has paved the way for a greater degree of acceptance by offering to substitute the interstitial tissue of the dorsum of the hand as the point of introduction in place of a vein. He claims that the emulsion is taken up by the lymphatics, and through them reaches the blood-current, and thence the affected parts of the lungs. The emulsion recommended by him consists of gum arabic, 1 gramme (15 grains), dissolved in 1 gramme of water; this is then rubbed up with 2 grammes of pure balsam of Peru and 2 of physiological saline solution (three-fourths of one per cent.). The mixture is then made up to 10 grammes by adding more neutral solution. It is, of course, sterilized before use, and it is scarcely needful to add that the injections are always painful. Whether the condition met with at autopsia of patients thus treated proves that the balsam of Peru really reached the parts of the lung affected is not yet proved. Until Dr. Opitz can prove that balsam introduced into the system in this way really reaches the affected parts of the lungs and lodges there, scepticism on the subject will not, we hope, be considered unreasonable.

THE PRODUCTION OF NEPHRITIS BY BALSAM OF PERU.

The danger of the production of nephritis in the administration of various balsams, particularly copaiba or styrax, is well known, but as yet only two cases of nephritis produced by the administration of balsam of Peru have been reported. One of these cases was that of a painter affected with lead colic, in whom the external use of balsam of Peru in the treatment of scabies led to the passage of blood and tube-casts in the urine. In the *Centralblatt für Klinische Medicin* for February 15, 1890, DRS. W. BRÄUTIGAM and E. NOWACK publish notes of twenty-two different experiments made on different patients as to the influence of balsam of Peru on the kidneys, making careful analysis each day of the urine, especially as regarded amount, its color, specific gravity, presence or absence of albumen, and general characteristics. The balsam was given by the mouth in twenty per cent. oil emulsion or in pill form, at first with wax, and afterwards with magnesia as an excipient; it was given subcutaneously and by prolonged friction externally. These different experiments, in which the drug was given in the most varied dose, failed to confirm the opinion so frequently advanced as to the existence of any danger whatever from the action of this balsam on the kidneys, nor were they able to detect that it produced any tendency even to inflammation of the stomach or intestine, or any action in the way of production of excessive irritation of mucous membrane. Even the immense amount of nearly three ounces was given in twenty-four days without producing any reaction whatever. No discoloration, even of the urine, no action on the stomach or intestine. The absorption of the balsam of Peru was, however, proved by the fact that the reaction of the urine was highly increased in acidity through the presence of hippuric acid. The balsam of Peru is thus not comparable to copaiba or styrax in its action upon mucous membranes or kidneys.

The reason for this is, perhaps, to be found in the different percentages in the etherealoids, since balsam of copaiba contains eighteen to eighty per cent. Balsam of Peru contains no oil whatever, but about fifty per cent. of benzoic ether, eight to ten per cent. cinnamic acid, and about thirty per cent. resin. Nevertheless, as is well known, the balsam of Peru is often adulterated with other volatile oils, and such falsifications are undoubtedly in fault where balsam of Peru is claimed to produce inflammation of the kidneys.

NERVOUS AFFECTIONS IN THE COURSE OF WHOOPING-COUGH.

Dr. Troitski gives in a Russian journal a short summary of three cases of whooping-cough accompanied by mental disturbances, difficulty in or loss of speech, and loss of power, or even paralysis, of certain groups of muscles. The first case was that of a little girl 2 years old, who, during an attack of whooping-cough complicated by bronchitis, was seized after some paroxysms by distortion of the eyes, blindness, and contraction of the arm flexors, quiet delirium and widely-distended pupils, Cheyne-Stokes breathing, diminution of the patellar reflex and of the sense of touch and of pain. At another time she became unconscious, and there were clonic contraction of the facial muscles and staring eyes, the pupils being dilated and not insensitive to light. Soon afterwards a general eclamptic condition with Cheyne-Stokes phenomenon came on, the attack lasting for an hour and a half, and giving place to stupor which lasted twelve hours, and during which the child could see, but did not understand, and called things and people by wrong names. These attacks gradually diminished, and in two months she was convalescent. The second case was that of a boy 3½ years old, who had severe headache and difficulty in thinking and speaking during the fourth and fifth weeks of the whooping-cough, which was complicated by pneumonia. His speech returned after three months, the whooping-cough lasting eight weeks. The hearing was much impaired. The third case was that of a little girl of 7 months old, who in the fifth week of her illness had two eclamptic attacks; and in the sixth week impairment of power in the right arm, the deltoid being especially affected. The arm became quite paralyzed after a fit of coughing. Dr. Troitski saw the child again after three months; the paralysis of the arm had disappeared without any treatment, the attacks of coughing having ceased when the arm became powerless. He considers that these conditions were due to disturbance of the circulation, and through that to morbid changes in some part of the brain.—*Lancet*, March 8, 1890.

A NEW SURGICAL DRESSING.

In a letter to the *British Medical Journal* for March 8, 1890, the Paris correspondent writes that M. Roux proposes to abolish the ordinary method of dressings, which he regards as useless and troublesome, and to substitute a modified form of dressings. He has employed two methods with very good results, the *pansement suturé* and the *suture pansement*, both dressings being made with gauze saturated with sublimate, and again steeped in sublimate at 1 per 1000. The *pansement suturé*, which is applied exclusively to wounds which are not drained, consists of a band of iodoform gauze covering the suture line, and one or more bands saturated with corrosive sublimate or compresses. The last of these is fixed to the skin by a stitch at each corner. These dressings, which are easily applied, allow the regions surrounding the wound to be watched. If necessary they are wetted again with the solution at 1 per 1000 after a day or two. The *suture pansement*, employed for wounds which close by the first intention only, consists of a double band of iodoform gauze, from two to two and one-half centimetres wide, which is placed on the exterior edge of each lip of the wound, and enclosed in the cutaneous suture. The operator begins with a knotted stitch, and unites the basis of the adjusted fragments by passing the needle through a small india-rubber tube between each stitch. When he has reached the end of the wound he returns backward, adjusting the edges of skin in making them overlap. The thread is tied with the tail which remained free at the starting-point. In order to remove this dressing the band is raised by one of the corners, and all the threads which are discovered on one side of the cicatrix are easily cut. In removing the other half the portions of threads which are inserted in the flesh are carried away. M. Roux considers that these dressings may be substituted with advantage for the ordinary method employed. But, as he allows that they can only be efficient when applied in localities and by persons absolutely free from microbes, it cannot be expected that they will entirely replace Lister's dressings in the present day.

PANCREATIC DIABETES.

In a previous issue we referred to a theory advanced by Dr. R. Lépine as to the production of diabetes from insufficiency of the pancreatic ferment. In the *Lyon Médical* for January 19, 1890, Dr. Lépine publishes a second communication on this subject, in which he refers to several experiments which seem to support his theory. He refers in the first place to an experiment performed upon a dog which had been allowed to fast for

thirty-six hours and in whom the pancreas was completely removed; the animal was allowed to fast twenty-four hours longer and was then killed by bleeding to death; his blood was collected and another dog was killed at the same time, but from whom the pancreas had not been removed, who had likewise fasted for sixty hours. The urine of the first dog contained sugar at the time of death. All the arterial blood was collected from these two animals and the sugar estimated in each case, both at the time of bleeding and half an hour later after defibrination and fifteen hours later after having been kept at a low temperature. The following figures represent the amounts of sugar found in 1000 parts by weight of arterial blood:

	Healthy Dog.	Dog without Pancreas.
Immediately after bleeding.....	1.17	3.30
Half an hour later.....	1.10	3.23
Fifteen hours later.....	0.72	3.04

The great proportion of sugar in the blood of the animal from whom the pancreas was removed is very striking, while the small amount of sugar which disappears in the blood of this animal as contrasted with the normal blood is also worthy of attention. Thus, while in half an hour the blood of the normal dog had lost 6 per cent. of the amount of sugar originally present, the other had only lost 2.02 per cent.; while at the end of fifteen hours the blood of the healthy dog had lost 15 per cent. of the original amount of sugar and the other only 8 per cent.

Dr. Lépine also mixed the blood of these two animals with the same quantity of starch mucilage, and found that the blood from the healthy animal was capable of converting a larger amount of starch into sugar than the blood of the dog from whom the pancreas had been removed, claiming that this fact proves that removal of the pancreas reduces the amount of ferment in the blood.

SALOL AND TERPINE HYDRATE IN COLDS.

In the *Medical News* for February 8, 1890, Dr. S. Solis Cohen writes that for the past two years he has been using a pill composed of 3 grains each of salol and terpine hydrate in the treatment of mild attacks of bronchitis, catarrhal fever, acute and subacute, the dose being 1 or 2 pills every two, three, or four hours, according to indications. Dr. Cohen writes that the results of this treatment are quite satisfactory, especially in those cases of general cold, in which there exists more or less muscular and articular pain associated with symptoms of bronchial catarrh.

In the more severe types of colds, Dr. Cohen has found it well to combine with this treatment the use of some good alcoholic preparation of bark, or even quinine and whiskey. Fluid extract of cocoa is also quite useful. When the nasal symptoms are troublesome, they may be completely relieved by the judicious use of belladonna or atropine, the dose to vary with different individuals. It should be just short of the quantity required to produce full physiological effect. In cases where severe lumbar pains suggest renal congestion the prompt administration of some simple alkaline diuretic, such as solution of ammonium acetate, with spirit of nitrous ether, is of benefit.

NARCOTIC EFFECTS OF ESSENCE OF NUTMEG.

Essence of nutmeg is generally considered to be a general stimulant; but recent observations tend to show that, although small doses produce a certain degree of excitement, large ones have a powerful narcotic effect. Cullet has reported a case in which a man who had swallowed half an ounce of powdered nutmeg became sleepy and stupid. Savager has had a case where a child who had chewed five large nutmegs was sent into a deep sleep, with relaxation of the muscles. MM. Cadéac and Albin Meunier, who have made systematic observations on the subject both on animals and on human beings, have expressed their conviction that nutmegs should be classed among narcotics rather than among excitants. These observers found that doses of 20 centigrammes, or about one-third of the quantity of essence yielded by an average nutmeg, when injected into the venous circulation of a dog weighing fifteen kilogrammes, produce almost immediately symptoms of great fatigue, drowsiness, and torpor, so that the animal can be beaten without its attempting to move; sometimes also vomiting and involuntary defecation occurs. When a dose of about four times this amount is given, there are some signs of excitement, and the animal becomes hypersensitive to light and noise; but its movements, though strong, are stiff, and there is great want of co-ordination. After about

half an hour prostration comes on, and it slinks away into a corner. With very large doses—about ten times as large as the first mentioned—there is hyperæsthesia of the sensorium, with muscular rigidity, the movements being characterized by great want of co-ordination; convulsions also occur, and regular voluntary movements only become possible after about half an hour, when the animal is completely exhausted. A dose of 50 centigrammes will kill a dog weighing six kilogrammes in twelve hours, and a dose of 1.25 grammes a dog weighing nine kilogrammes in an hour and a half. A dose of 65 centigrammes (about 10 grains), or even double that quantity, in the human subject produces no general excitement, but merely a slight headache, at first supraorbital, then frontal, and some diminution of cerebral and muscular activity. Essence of nutmeg produces gastric and intestinal contraction; but it has little effect on the circulation, and, such as it has, is of a sedative or depressing character, and consequently it is erroneous to prescribe the drug as a "cordial." —*Lancet*, February 15, 1890.

PHYSIOLOGICAL ACTION OF SELENIOUS ACID.

The many striking analogies in chemical properties that exist between the compounds of sulphur and selenium suggested to MESSRS. CHABRIE and LAPIQUE a comparison of their physiological action. Some preliminary experiments have been made with selenious acid (*Compt.-Rend.*, ex., 152), which showed that it is reduced by a solution of glucose containing beer yeast, but not by one from which beer yeast is absent. In order to test further the behavior of the acid towards ferments, beef bouillon was placed in test-tubes, with varying quantities of selenious acid added, and exposed to the atmosphere at a temperature of about 25° C. It was found that a little more than 2 parts per 1000 of acid was required to prevent the fermentation of the bouillon under the influence of the ordinary atmospheric microbes, and that in the presence of a smaller proportion fermentation was set up, in which case the selenious acid underwent reduction. In other experiments it was ascertained that, unlike the sulphites, which, when injected into the blood, are oxidized into sulphates, and so rendered innocuous, selenious acid does not exercise a reducing power, but acts as an irritant poison. An aqueous solution of selenious acid, exactly neutralized with soda, was fatal to dogs when administered in doses of 3 milligrammes ($\frac{1}{20}$ grain) per kilogramme (two pounds) of body weight, the most remarkable symptom consisting in a very abundant bronchial secretion.—*Pharmaceutical Journal and Transactions*, February 1, 1890.

LYMPHADENOMA AND ITS TREATMENT.

At a recent meeting of the Paris Surgical Society (*Revue Générale et de Clinique et de Thérapeutique*, No. 47) M. RECLUS related the case of a young man who was the subject of lymphadenoma, a large mass of glands occupying both sides of the neck from the mastoid to the clavicle, and extending posteriorly beneath the trapezius muscle, and causing some dyspnœa. There were no swellings in other situations, no signs of tubercle, and no leucocytosis. As extirpation was out of the question, arsenical treatment was vigorously pushed, commencing with five drops of Fowler's solution daily, which was increased by two drops every day, when also injections (amounting to ten drops daily) were made of the same solution into the hypertrophied glands themselves. The injections produced small abscesses, which healed spontaneously; and at the end of two months, when as much as twenty-five drops per diem were being taken, and a notable diminution had taken place in the swellings, the treatment was suspended. It was, however, renewed from time to time, and finally replaced by phosphide of zinc, the result being most satisfactory, only two or three barely perceptible nodules remaining at the site of the previous tumor. M. Reclus gave particulars of two other cases similarly treated with success, and also of three in which the result was unfavorable. Although, then, he pointed out, arsenic could not be said to be absolutely specific, yet it is certainly very efficacious in lymphadenoma, of which clinically there are two forms,—the benign and the malignant. Surgical interference, he thought, was harmful, in that it was rapidly followed by recurrence, as shown by Verneuil, Trélat, and Bouilly. M. Quenu admitted the good results of the treatment, but pointed out that the diagnosis was uncertain, and that under "lymphadenoma" often were included very different conditions. M. Routier mentioned instances of benefit from arsenic; in one case the disease was only temporarily arrested. M. Verneuil

also alluded to the difficulty of precise diagnosis, and considered that excision was permissible in the benign cases of simple glandular hypertrophy. M. Terrier said it was impossible to diagnose at first between a lymphadenoma and a simple hypertrophy, unless recourse were had to microscopic examination and inoculations, and that early excision might not be followed by recurrence even of lympho-sarcomata. M. Trélat said that glandular tissues which were not secondary, cancerous, or syphilitic were either tubercular or lymphadenomatous, the former in the great majority of cases. Benign lymphadenoma was the same as simple hypertrophy, and should be excised; while the malignant form, which is rapidly generalized, should not, he considered, be so treated.—*Lancet*, January 18, 1890.

USE OF RESORCIN IN WHOOPING-COUGH.

We have a number of times alluded to the results of Dr. Moncorvo and others as to the treatment of cases of whooping-cough by the topical application to the larynx of a one or two per cent. solution of resorcin. In this strength resorcin has practically no taste or odor, it does not irritate the mucous membranes, and is not poisonous, and yet is quite strong enough to be efficacious. The number of reports as to the favorable influence of resorcin in whooping-cough are rapidly increasing, the most recent being a paper by Dr. Farlow, published in the *Boston Medical and Surgical Journal* for February 27, 1890. He records several cases in which the ordinary treatment had no effect, and applications of cocaine, even up to twenty per cent., were of very little use. When the convulsive state of the disease was well marked, Dr. Farlow commenced the use of two per cent. solutions of resorcin, spraying it into the nose, the pharynx, and the larynx every two hours. The first day he found no change worthy of note, the next day the paroxysms were much less frequent, and by the fourth day the cough disappeared. Spraying was continued for a few days as a precaution, but there was no return of the cough, and the patients remained in perfect health. In one of these cases, he writes that he employed a preparation called cresolin, apparently an impure creosote, heating this over a lamp, and so filling the room with the fumes. Dr. Farlow refers to several cases occurring in his practice, and in them all he noted the most marked improvement from the application of resorcin. Dr. Farlow's method of employing this preparation by spraying seems preferable to the plan employed by Dr. Moncorvo of applying it to the laryngeal orifice with a swab, since by the former method he reaches both the nose, the pharynx, and the larynx. No symptoms of irritation, poisoning, or any constitutional effect were produced in any of his cases.

In the discussion which the reading of this report evoked before the Boston Medical Society, several other physicians endorsed the claims of Dr. Farlow as to the value of resorcin, some of the members stating that they had employed this treatment in undoubted cases of whooping-cough, and that the relief was certainly very marked.

MAGNESIA ISINGLASS AS A SUBSTITUTE FOR PLASTER OF PARIS.

Dr. Josef Englisch states in a communication to the *Wiener Medizinische Wochenschrift* that in his experience isinglass is preferable to plaster of Paris for rigid bandages, on account of its lightness coupled with extraordinary firmness. It is, according to the author, especially adapted to cases in which the patient is intended entirely or partly to follow his usual occupation. Its disadvantage is, that it takes a long time to harden, and he mentions this as the reason why it has not yet been generally adopted. To obviate this disadvantage, he has used for the last eight years magnesia isinglass, for which he claims excellent results. Four parts of a solution of soda isinglass are by slow boiling reduced to the consistence of thick syrup, and then triturated with one part of finely-powdered magnesia, till the mixture becomes whitish with a slight yellow tinge. The unrolled bandages are laid in this pultaceous mass, well stirred in it, and then carefully rolled upon a wooden roller. The prepared bandages must not be exposed to the air for more than fifteen or twenty minutes, and before their application the limb is covered with a double layer of ordinary calico bandage. No cotton-wool or flannel must be used. Four or five layers of the magnesia isinglass bandage are sufficient for the arm, but five or six layers are required for the lower extremity. When the apparatus is intended to remain undisturbed for a longer time than is usually the case, slips of the same material, or of thin leather or cardboard, may be inserted between two successive layers; not all together, as this would inter-

fere with the adhesion of all the layers. From ten to twenty minutes after its application the apparatus ceases to be sticky, and in from three to ten hours, according to the temperature of the room, it is perfectly hard. It is easy to cut, remove, and reapply the apparatus, so that it does not interfere with other therapeutic measures.—*Lancet*, January 18, 1890.

Reviews.

MANUAL OF SKIN-DISEASES. By W. A. Hardaway, M.D., Professor of Skin-Diseases in the Missouri Medical College, etc.
St. Louis: Theo. F. Lange, 1890.

This volume, which in size occupies a position midway between that of the usual handbook and a complete treatise, contains much that is valuable to the student and to the active practitioner. The subject is handled in a thoroughly practical manner, with special emphasis upon diagnosis and treatment. The descriptions are free from ambiguity, and the therapeutic directions given with such clearness, that there is scarcely chance for misunderstanding. The author's own experience is freely quoted, and around it is woven the suggestions of other dermatologists. The diseases are presented in alphabetical order, which, while a departure from the usual method, has in books of this character many evident advantages. An appendix is added, containing formulæ and a diet-table. The book may, in short, without reservation, be advised as a safe guide in the management of these troublesome diseases.

The paper and general appearance of the volume are not in harmony with the intrinsic merit of the author's part of the work.

THE PRINCIPLES AND PRACTICE OF SURGERY, BEING A TREATISE ON SURGICAL DISEASES AND INJURIES. By D. Hayes Agnew, M.D., LL.D., Professor of Surgery in the Medical Department of the University of Pennsylvania. In three volumes. Second edition.
Philadelphia: J. B. Lippincott Company, 1889.

"Agnew's Surgery," the first volume of which appeared in 1878, was received by the medical profession and medical press with the just appreciation due to the merits of the work. The exhaustive investigations of the various subjects, and the practical character of the conclusions, have made the work a source of information for the surgeon and a book of reference for the student. A second edition was naturally to be expected, and the profession is to be congratulated upon the author being able to give the work his personal supervision.

The many changes in opinions, and the progress made in methods of treatment, during the past decade have been numerous in all departments of medicine, but more especially is this true in the surgical advances for the past ten or twelve years. That such changes and progress have not been overlooked and have been fully appreciated by Professor Agnew the above work gives evidence of, and a comparison of this edition with the previous one shows that there has been a complete revision of the work, with many valuable additions. The favorable views expressed by the press as to the merits of the first edition we then cordially endorsed, and now, after ten years of frequent consultation of its pages, we are only more confirmed in our opinion of its value. In our notice of this edition we will only briefly call attention to some of the additions the author has, from his experience and observation, considered necessary.

An important, indeed the most important, addition to Professor Agnew's work, is the chapter on "Antisepsis." It is the acknowledgement of the victory of this method. In the words of the author, "Antiseptic surgery has come to stay, and the sooner this fact is recognized the better for both surgeon and patient." While in the first edition this method of treatment in surgical practice was spoken of with favor, yet it was not believed the time had come for urgently advocating its exclusive adoption. That there may be no doubt in regard to Professor Agnew's opinion upon the value of antisepsis, we quote as follows in regard to micro-organisms and disease: "These facts applied to the study of surgical pathology have illuminated as with a sunbeam those morbid and often fatal processes which are commonly observed in the human body, especially in connection with wounds, and it is by such application that Lister has established a great principle, which will live while the world remains, which has already revolutionized surgical methods, and which makes its discoverer stand to-day the most conspicuous figure of the surgical world."

In the application of antiseptic methods to operations; the cleansing of the region of the body where the operation is to be performed; the preparation of the surgeon and assistants; the protecting of the seat of operation from

coming in contact with unclean substances, and the careful disinfecting of the instruments, are all insisted upon. The manner of accomplishing these necessary procedures are concisely and judiciously given.

The etiological factor in the process of suppuration is admitted to depend upon the presence of certain micro-organisms. "In the light of modern pyogenic literature, the presence of puritic organisms may be regarded as the true cause of suppuration." In answer to the questions of the possible formation of laudable pus, without the presence of these micro-organisms, and the presence of these organisms in the economy without suppuration occurring, Professor Agnew is inclined to accept the view of Rosenbach and of Klemperer, and considers it established, from their investigations, that healthy pus and micro-organisms are always found together; while it is also true that the same micro-organisms may exist in the lymph and blood without occasioning suppuration. Why this seeming contradiction can exist is explained upon the ground of the necessity of a favorable surrounding, in order that the micro-organisms may develop their pyogenic powers.

While the formation of pus is said to be due to the presence of these micro-organisms, yet Professor Agnew does not admit that such organisms are the only etiological factors in the process of suppuration. He writes: "These micrococci, growing and multiplying in the tissues, or in the discharges of a wound, and causing the formation of new and irritating products, may be accepted as one of the very common causes of inflammation and suppuration, though the same results may follow the presence of other irritants in different individuals." What the other irritants are, which may give origin to suppuration, is not clear. Peculiarities of tissue, imperfect use of germicidal agents, special diseases, or mechanical irritation, are said to be favorable conditions for the growth and multiplication of parasitic organisms. These are, however, not the true cause of suppuration, since investigation has demonstrated that there must be something more than foreign bodies or peculiarities of tissue. In a word, we believe there is but one cause of suppuration, and that is the presence of micro-organisms.

In the treatment of *chronic or tuberculous abscess*, the adoption of the germ theory of suppuration has necessarily demanded a change in the method of procedure. In the first edition it was advised that a "masterly inactivity should govern the surgeon." We are now very properly advised, since "we have come to understand the relation of suppuration to pyogenic organisms, the management of tuberculous or cold abscess does not materially differ from that proper to the acute form of the disease." It is very evident that Professor Agnew, at the time he wrote his first edition, was not satisfied with the method he then advised for the treatment of this affection. We find he then wrote: "I am disposed to believe that we have followed too blindly this venerable practice of abstaining from all interference with these abscesses, and that, when feasible, it might be better to open them as soon as discovered, by which a large, pus-forming, blood-vessel surface is prevented; but my experience in this plan is too limited to justify any positive statement."

The question of *drainage* in the healing of wounds receives attention. Rubber and glass tubes are preferred; bone tubes have not proved satisfactory in the author's practice, and for capillary drainage either catgut or horse-hair may be used. The reasons given by Professor Agnew for the employment of drainage are that it prevents distention, inflammation, suppuration, and septic poisoning. As he writes, it is for the purpose of maintaining the wound in an aseptic condition. Many surgeons, at the present time, may take issue with these reasons, and reply that it is on account of the employment of drainage-tubes that the wound is rendered septic. In their opinion a perfectly aseptic wound requires no drainage. It is the use of drainage-tubes which makes primary union impossible. The exuded fluids from a wound they believe to be reserve fluids, and are absorbed into the system; by drainage they are lost, and become poisoned by micro-organisms. The success which has attended the treatment of wounds by the so-called organizing of the blood-clot, is evidence in favor of the uselessness of drainage, and the more recent introduction of the "dry method of operating," by Landerer, of Leipsic, is also further proof that it is advisable to do without drainage in aseptic wounds. It must be admitted by all that the drainage-tube is a foreign body in the wound, and must interfere with primary union. The perfect dressing for wounds would be one in which nothing is present to interfere with the healing process of nature; any foreign element, drains, or organisms are injurious; therefore, if the wound is aseptic, we do not require drainage to main-

tain it in this condition. Drainage, however, has its advantages, and is not to be neglected; indeed, it is a most valuable method, if not absolutely necessary, in the treatment of certain wounds, where perfect asepsis is not possible, or where for some reason the surgeon anticipates septic infection.

The section treating of "Hydrophobia" remains the same as in the first edition, except the addition of a short paragraph referring to Pasteur's investigations, in which it is stated that, probably by inoculation of dogs with an attenuated virus, the disease may be prevented, and possibly the same treatment in man may render the virus harmless.

The author's experience in *traumatic epilepsy*, treated by trephining, since writing his first edition, has increased from three to twenty cases, and, although his results have not been so favorable as some other operators, yet he believes the operation will eventually be more successful. The reasons why results are not often more favorable is, in his opinion, first, the operation is postponed too long after the premonitory symptoms have been developed, what was at the beginning only a reflex action from dural irritation, has later become central and organic; second, too limited use of the trephine.

The progress made in operative surgery of the brain during the past ten years has been certainly great, and of such importance to the surgeon, that Professor Agnew has wisely felt the necessity of adding a section on "Cerebral Topography," in which the views of investigators in regard to the doctrine of localization of cortical lesions are concisely given. The rules to be observed in operations on the brain are most judicious, and should be carried out in every detail when such operations are undertaken.

The chapter on "Wounds and Diseases of the Abdominal-Pelvic Cavities and their Contents" has been rearranged, rewritten, and much added to. The general directions in laparotomy are given at the beginning of the chapter, and are those adopted by surgeons who recognize the necessity for absolute cleanliness in every detail in order to secure the best possible results. The directions for performing the operation for stenosis of either the pyloric or cardiac orifice of the stomach by digital dilatation (Loretas's operation) are given, with the remark, that such an operation is only justifiable after all other means have failed to relieve the patient. *Pylorectomy*, owing to the great mortality which follows it, is scarcely thought to come within the sphere of legitimate surgery. *Gastro-enterostomy*, although considered to be a more justifiable operation than pylorectomy, it is believed, if the mortality cannot be reduced, will probably receive but little favor among conscientious surgeons.

Many diseases which were, comparatively a few years ago, considered to belong exclusively to the province of the physician, are now transferred to the surgeon. Among such changes are *typhlitis* and *appendicitis*. In regard to surgical interference in cases of suppurative typhlitis and appendicitis, Professor Agnew advises not "to act hastily," and "if, after waiting seven or eight days, no amelioration occurs, or if after such a lapse of time the local symptoms continue to increase, the time has arrived for operative interference." Exceptions to this rule are said to occasionally occur, and from their acute course demand earlier interference.

Under "Hernia" the various operations for its radical cure are given, including the more recent ones of Baker and Macewen. The conclusion reached by Professor Agnew is "of the various operations proposed and practised for the radical cure of hernia, not one can be said to be altogether satisfactory; that of Macewen, in my judgment, promises to be the most successful."

The treatment of simple fracture of the patella remains essentially the same as in the first edition. The employment of Malgaigne's hooks is condemned as strongly; and while antiseptic methods are said to have lessened the danger, when they are used, yet their employment is not believed to be advisable. In reference to the operation of cutting down and exposing the fracture in recent cases and wiring together the fragments, Professor Agnew writes: "I feel constrained, however, to condemn the operation without qualification."

We have in the above notice briefly called attention to most of the additions which have been made to the second edition, and, as previously stated, there have been but few omissions of any importance, so that the work, as a whole, may be considered to represent the views and opinions held, at the present time, of the principles and practice of surgery.

J. H. C. S.

THE PHYSICIAN'S LEISURE LIBRARY. A TREATISE ON FRACTURES. By Professor Armand Després. Translated by E. P. Hurd, M.D.
Detroit, Mich.: Geo. S. Davis, 1890.

The above is a translation of Professor

Després's article on "Fractures," taken from the third edition of his "Chirurgie Journalière." This small volume, while it does not pretend to be a complete treatise on fractures, is certainly an original and very suggestive work. Many of the old methods of treatment are, in the author's opinion, wrong in principle and unsatisfactory in results. The foundation of successful treatment in fractures is good position and the prevention of movement. How best to obtain these, Professor Després has given us his experience, and Dr. Hurd's translation, with his additions, make a volume from which many useful suggestions may be taken.

J. H. C. S.

THE PHYSICIAN'S LEISURE LIBRARY. EDUCATION AND CULTURE, AS RELATED TO THE HEALTH AND DISEASES OF WOMEN. By Alex. J. C. Skene, M.D. Detroit, Mich.: Geo. S. Davis, 1889.

This is a very excellent, thoughtful, and judicious treatise upon a subject of growing importance. It bears upon the whole "woman question" of the day and of the future, and discusses it with care, and in guarded and refined language. It can be read throughout by the non-professional person, young or old, male or female, without such person being shocked or mystified, and yet with a clear understanding of its meaning. And unless this can be said, a book on this subject is quite useless, since the people to be reasoned with and converted from the error of their ways are non-professional, and must be neither bewildered by medical technicalities nor shocked by medical frankness; and while it is always well to call a spade a spade, other implements should not always be so boldly mentioned. Dr. Skene has succeeded admirably in this respect. While going thoroughly into topics which society has agreed to "taboo," he has used such care that none can take offence and accuse him of too much freedom, and has avoided also "sensationalism,"—the rock on which so many goodly volumes of well-meaning authors have gone to wreck and ruin.

E. W. W.

CHRONIC BRONCHITIS AND ITS TREATMENT. A CLINICAL STUDY. By Wm. Murrell, M.D., F.R.C.P., etc. London: H. K. Lewes, 1889. Philadelphia: P. Blakiston, Son & Co.

By this modest title the author places before the world some account of his observations and results in the treatment of one of the most chronic of chronic diseases, and one which destroys the usefulness of myriads before old age has come, making the middle-aged aged, making the aged decrepit and useless in the struggle of life. The author's mode, as described in this little book, is simply invaluable. On a large scale he has tested the remedies, new and old, which have been recommended for chronic bronchitis, and his observations, backed by his well-known reputation for careful and thorough work, will go far towards consigning some time-honored remedies to the dust-bin and pushing into prominence some new ones whose names are as yet unfamiliar to many a practitioner. The most useful part of his work, we think, is that included in the chapter on "The Ipecacuanha and other Sprays," in which he tells us how completely, in his hospital and clinical practice, the old routine cough medicine has given place to the atomizer, and how effectually ipecacuanha used by this method has benefited his cases. "Other sprays" include lobelia and tartar emetic. Of the latter he says, he "prefers ipecac," and the lobelia seemed of advantage in a few cases of bronchial asthma.

Tincture of cantharides, ℥i to ʒv, was also, he considers, of use in some very obstinate cases of chronic bronchitis. Jaborandi seems in no way superior to ipecac, while potas. iodid., two per cent. solution, gave satisfaction.

Tar and terebene and their allies form the subject of two chapters, in which the virtues of these remedies are carefully sifted. "Cheken and Cubebs" introduces us to the author's study of a new South American expectorant, in which he thinks he finds considerable virtue. In short, take the book throughout, it will serve, at least, to give the practitioner a fresh and vivid conception of the value of his remedies, and will impart to him some new and valuable ideas, which he may safely take, considering the reputation of the writer, on trust; and, if he wakes up to the value of ipecacuanha spray alone, he will find a vast improvement in a class of cases which generally tire his patience, till they become the patients of another.

E. W. W.

HISTORY AND PATHOLOGY OF VACCINATION. By Edgar M. Crookshank, M.B., Professor of Comparative Pathology and Bacteriology in and Fellow of King's College, London, etc. In two volumes. Philadelphia: P. Blakiston, Son & Co., 1889.

The author of these volumes seems to have labored conscientiously to extricate the

truth, if it be possible, from the various documents pertaining to the subject. Up to the time of beginning his work, he had held, he tells us, the generally received doctrine concerning vaccination; but his faith in it was shaken by his investigation of an outbreak of small-pox in 1887. "While attending at the National Vaccine Establishment of the Local Government Board," he "was unable to obtain any exact details of the source of the lymph which was employed there." This also stimulated his curiosity, and led him to think seriously of the necessity for further and more accurate observation, while in 1888 he happened, at the Library of the Royal College of Surgeons, to find a parcel of manuscripts, which contained letters from Hunter to Jenner, and a manuscript which was thought to be that of Jenner's "Inquiry." Finding that it differed from the published "Inquiry," he discovered it to be "Jenner's Communication to the Royal Society." In it he was struck by "the small amount of evidence upon which Jenner had first ventured to propose 'vaccination' as a substitute for 'variolation.'" From this point he pursued the subject with all the aid obtainable, and visited Paris and Bordeaux. The result of all this labor is the present work, which contains, in very attractive form, about all the information accessible up to the present time.

We think the medical reader will receive somewhat of a shock from many of his pages, and will be by no means so clear as to what he is doing when he "vaccinates," as was his wont before. The author, we think, will furnish very substantial pabulum to the "antivaccinationists," though this seems unavoidable; but, as for himself, he is evidently a believer in its efficacy. While convinced that we are vaccinating from material derived from many sources, some very obscure, and that it seems as though vaccination performed with lymph drawn from divers directions was equally efficacious, Jenner's theory of the derivation of vaccinia from the horse grease takes on a far more probable appearance, and evidently is believed by the author to possess some foundation.

The account given by him of the experiments in India, based upon what he terms the "cow-small-pox" theory," is extremely interesting, as is also the record of his researches into the subject of horse-pox in France, where he went for the express purpose of study. Perhaps the most startling chapter in the book is that upon "Human Small-Pox as a Source of Vaccine Lymph," this lymph not being obtained by inoculating cows with small-pox, but by a constantly descending series of inoculations from one child to another with mild, variolous virus, which resulted in the final production of a virus giving a pustule very much like vaccinia, and with but little tendency to produce contagion in those brought into contact with the subjects of experiment.

The only deduction possible, after reading the work through, is, that if the facts are as stated, there must exist among the higher animals and man a wide-spread pustular disease, taking different names, according to the animal upon which it happens to be found. Often contagion among animals of the same family is capable of conveyance to other families by actual contact with an abraded surface, and is capable in every case of producing in the cow vaccinia, and in human beings, from the cow, vaccination; that it can also be conveyed from any one of the animal cases to the human being, and there protect him, more or less, from suffering from his own peculiar form of this pustular disease,—viz., small-pox; that after a series of inoculations on human beings, commencing at first with any one of these animal varieties, we arrive at the well-known vaccine vesicle, from whichever source we start. Thus, if we start with "horse grease," after a series of infants have been vaccinated with it, the resulting vesicle will appear just the same and just as typically like vaccinia as though we had started with sheep-pox or "goat-pox," and will be equally protective against small-pox.

There is also a glimpse shown, in a careful view of the evidence produced by the author, that there may be a tendency under certain circumstances for the vaccine disease to at times revert to variola, and that in wholesale vaccinations an air of variolous contagion may be produced, though this is by no means certain.

The reader can see, from this brief sketch of the author's work, how far evidently we are from a definite knowledge of what we are doing when we perform the simple operation of vaccination. Many more things he will see also as he reads the book, which he may not previously be aware of. He will find that from Jenner's time on, vaccination has, at times unexpectedly and mysteriously, suddenly become a very formidable thing; that the tendency to form "ulcers" was recognized and dreaded by Jenner; that Jen-

ner's mortality, even from his comparatively few experiments, was by no means *nil*, and that he took a very roundabout way to suppress it in his statistics, or what he considered as such. In fact, Jenner by no means looms up as a hero in the author's pages; but, as he gives us a whole volume of documentary evidence, we have to judge, we fear, about Jenner very much as the author does, who gives us a very beautiful picture of Mr. Benjamin Jesty on his first page, and accords to him in reality the honor which the world of late has been disposed to accord to Jenner alone. We may add that the work is well and expensively illustrated with colored plates, is beaufully printed on the best of paper, and becomingly bound. E. W. W.

Correspondence.

PARIS.

(From our Special Correspondent.)

Ouabain and Strophanthin as compared with Cocaine—Potassium and Sodium Iodides not Equivalent in Therapeutics—A New Expectorant—Hypnal, a New Hypnotic—Absorption of Rabic Virus—Traumatic Meningitis—Panbotano—Fire from the Thermo-Cautery—A Wedding.

The anæsthetic effects of ouabain and strophanthin have been further investigated by Dr. Gley, who has found them to show an interesting dissociation of sensibility. Recent researches have proved thermic sensibility to be distinct from sensibility to pain and to touch. But even in the thermic phenomena a difference can be noticed between the effects of cold and heat. H. Donaldson's experiments with cocaine have clearly demonstrated this distinction. Similar phenomena, differing but slightly, are observable with ouabain and strophanthin. Sometimes, especially with ouabain, the two forms of sensibility were noticed not to disappear simultaneously, the sense of cold persevering after tactile sensibility was lost. But the striking phenomenon was the reappearance of thermic sensibility before touch anæsthesia would begin to pass away.

Another effect of the local anæsthetics in question is their augmentation of intraocular pressure. One hour after 5 or 6 drops of ouabain or strophanthin solution have been, for instance, dropped into a rabbit's eye, the organ will much increase in size, and project out of the orbit, remaining for several hours in the same state. The same symptoms, it is known, are caused by cocaine. And, lastly, as also will happen with cocaine, repeated instillations of the solution will bring on incipient opacity of the cornea. Another salient which should not pass unnoticed is the fact that chemicals in no way alike, and proceeding from plants widely different botanically, should possess physiological properties so nearly similar.

On the other hand, that substances closely related, chemically, may act in a very different manner, is nothing new, and the striking illustration afforded by the very unlike effects of arsenic and phosphorus compounds, is probably familiar to all. Yet therapeutists are too often ready to forget the warning and follow chemical or botanical analogies. Dr. Laborde, at a meeting of the Academy of Medicine, strongly protested against such a tendency, and quoted a number of examples. Iodide of sodium, for instance, has often been proposed, and is now and then used, in place of the potassium salt. But the two chemicals will not act alike. Potassium iodide will notably increase blood-pressure, and occasion cerebral symptoms not obtainable with sodium iodide. In consequence, it is not indifferent at all which of the two salts is given. In heart affections sodium iodide has recently been administered in enormous doses without harm, it is true, but without much success; and one of these cases having come under Dr. Laborde's notice, a change to potassium iodide and smaller doses afforded immediate relief. The same difference can be observed with the chlorates. Sodium chlorate, being more soluble, has been recommended by some in place of potassium chlorate. But the physiological effects are not the same, since 3 to 4 grammes (45 to 60 grains) of the potassium salt will suffice to cause in a dog symptoms of intense asphyxia, while 10 grammes (2½ drachms) of sodium chlorate have scarcely any effect. And the therapeutic difference is no less marked, as potassium chlorate will dissolve false membranes and sodium will not. *A fortiori* bromides must not be substituted for iodides, cinchonidine for quinine, and so on through the list. But there are few now willing to go so far, much as some dealers would like to find a market for their cinchonidine.

A new expectorant has made its appearance, on the recommendation of Dr. Schoengut, of Vienna. The drug is the bark of the *Naregamia alata*, a shrub growing in the Portuguese Indies, and well known to botanists, but

hitherto untried in therapeutics. The preparation used is the tincture of the dry bark,—1 to 5, probably,—which is to be given as follows:

Tincture of naregamia, gtt. xv to xlv;
Cherry-laurel water, ʒiiss to ʒviii. Mix.
Dose.—10 drops every hour.

The medicine has been found efficacious as an expectorant in affections of the respiratory organs, and especially beneficial in cases accompanied with scanty secretions and much coughing, or when there is an abundant discharge of viscous and bloody sputa. The effect has been excellent in heart-diseases with catarrh, also in pulmonary emphysema. Tuberculous patients, on the other hand, were but temporarily improved. In favor of the new drug it is claimed that it affects neither circulation, blood-pressure, nor digestion, and is not poisonous.

The next new remedy is of chemical origin. When antipyrin and chloral are brought into contact, an oily liquid results, in which, after a while, crystals are formed, and the new compound has a comparatively bland taste, very different from either constituent. The reaction is not a new one by any means, but the therapeutic value of the chemical scarcely appears to have been fairly tested. At least the divergence of opinions is too wide to be definitive. According to H. Ludwig Reuter, the crystals are inert, and French therapeutists, naturally conservative, have contented themselves with recommending that chloral and antipyrin be not administered together. But, at the last meeting of the Therapeutic Society, Dr. Bardet reached a very different conclusion, based upon a number of experiments. He said that hypnal—and may heaven's blessing be upon his head for the abbreviation—is merely the trichloracetyl-dimethylphenyl-pyrazol obtained when chloral and antipyrin have combined to form the crystalline compound above alluded to. In good justice, it should be mentioned that Herr Reuter, being a German, gives for the same compound a similar name, with two syllables more. Well, hypnal, according to Dr. Bardet's experiments, far from being inert, possesses marked sedative and hypnotic properties. In doses of 1 gramme (15 grains) it was found, in twenty-two cases under observation, to induce easy sleep, and proved especially useful in sleeplessness consequent upon pain or coughing. As it is neither caustic like chloral, nor irritating like antipyrin, it is easily tolerated by the stomach, while its faint taste is an advantage in infantile practice. To complete the subject, it should be added that Mr. Reuter only experimented with rabbits, and never pretended to draw absolute conclusions applying to men. M. Bardet, on the contrary, tried it with men, a circumstance sufficient in itself to explain the apparent contradiction, since many nowadays believe there is much truth in that legendary story of the medicine that cured parsons and was death on carpenters.

The absorption of rabic virus presents many anomalies, showing how mysterious some points still remain. At a meeting of the Biological Society, Dr. Galtier, of Lyons, related that he had concluded a long series of experiments on the subject, and gave the following summary of the results: On painting the mouth with a virulent solution, he got four cases of rabies out of thirty experiments, and two out of thirty with stomachal injections. The respiratory organs proved most sensitive, fifteen out of thirty experiments having resulted in death by rabies. The conjunctiva gave six out of thirty, and the genito-urinary membrane three for twenty. Dr. Nocard, on the contrary, gave it as his opinion that the mouth and digestive organs are, when in sound condition, proof against rabic inoculation, and related the following illustration: "Lately I had a fox which I fed almost regularly with the brains and marrow of dogs and foxes dead from hydrophobia. Although the animal ate thus several kilos of highly virulent rabic material, he never caught the disease, and never even became vaccinated. For soon after, rabic virus having been inoculated, the fox died with all the symptoms common to the canine species." But a strange case is one observed by Dr. Dujardin-Beaumetz. The patient, a woman, had a dog which she ordered to be killed because it bit a child. Yet the animal was not considered mad, and never bit its mistress. Whether it licked her hands or face did not appear. Nevertheless, the woman undoubtedly died of rabies, as inoculations were made from her rachidian bulb at the Pasteur Institute, where, by the way, she never went for treatment. This is not the first instance of hydrophobia contracted through association with sick animals.

Much to their regret, physiologists cannot practise vivisection on men unless they operate on their own persons, a proceeding scarcely satisfactory because it disturbs the observer's equanimity. In consequence they make the most of accidental injuries which may confirm the theories based upon animal vivisection. Dr. Netter, some four years ago, observed that, on trepanning rabbits and introducing

under the dura mater pneumococci cultures, suppurative meningitis will almost invariably result. There was, however, no proof that such would be the case with men, when he was the other day called upon to attend a post-mortem on a man who had committed suicide by shooting himself in the mouth, and died after lingering eighteen days. The bullet, it appears, penetrated through the palate and the basilary process, and lodged in the brain. But the interesting feature of an otherwise commonplace occurrence was the existence of suppurative meningitis, due, no doubt, to the introduction of pneumococci transferred by the bullet from the mouth to the brain. The identity of the meningitis was proved beyond cavil by microscopic examination, cultures upon agar-agar, and inoculations to mice. As to the pneumococci, the proof was equally positive, the microbes having been found in the nasal mucus of the deceased, and identified by cultures and inoculations. The accident, Dr. Netter concludes, presented all the conditions of his own previous experiments on rabbits, and shows that traumatic meningitis may be caused by the same microbes as spontaneous suppurative meningitis, and also that some microbes, harmless in the bucco-pharyngeal cavities, may become, under special circumstances, dangerously infectious.

Panbotano, or panbolano, as some call it,—*Calliandra Houstoni*, a new bark from a Mexican tree of the Leguminosæ family,—has, of late, been introduced here as a cinchona substitute. Some efforts seem to have been made to push it as a "specialty." But Dr. Dujardin-Beaumetz having reported to the Academy of Medicine that chemists failed to discover any alkaloid or glucoside in the drug, the new venture has not proved a success.

A rather unusual accident has occurred at the Beaujon Hospital. A patient under treatment for a leg affection was to be cauterized with the thermo-cautery, when the medical *externe* in attendance accidentally set the wadding afire with the instrument, and the patient, a female, had her hands dangerously injured while trying to remove the dressing. A judicial inquest is to be held over the accident.

To end with a piece of news which probably will interest readers of the THERAPEUTIC GAZETTE, Mlle. Marie, daughter of Dr. Dujardin-Beaumetz, on March 19, married Dr. Forgue, an aide-major in the Second Engineers, and fellow (*professeur agrégé*) of the Montpellier Faculty of Medicine.

PARIS, March 20, 1890.

BERLIN.

(From our Special Correspondent.)

A very notable innovation in the field of electro-therapeutics has been discovered by the Berlin physician, Dr. Bröse, which many physicians have greeted with a particular degree of pleasure. This gentleman has found the means of making electricity engendered by the dynamo-machines serviceable in the province of medicine, including electro therapeutics and electro-diagnosis, electrolysis, galvano-caustics, illumination, and the use of electro-magnets in the eye clinic. It was on the same principle by which the Berlin electrical works for lighting the main streets were enabled to introduce illumination by electricity into dwellings.

The current is conducted into the special room of the physician, and then,—saying it possessed an electro-motor force of one hundred volts,—by means of various contrivances, it may be so changed that it can be gauged for medical purposes quite as well as that formerly engendered by elements.

The current necessary for electro-therapeutics and electrolysis possessed a high degree of constancy, and can be diminished by means of certain preparations to the amounts required.

The induction current also does good work. In spite of the apparently great strength required for the galvanic use of electricity (as much as two hundred milliampères), the consumption of electricity by this apparatus is so small that it cannot be compared in its cost to that obtained by elements.

Bröse will himself shortly publish an exhaustive work on the results obtainable by this apparatus, and will give a full description of it. The description of this new invention will be very welcome, since every physician who is obliged to work much with electrical apparatus must find that in the batteries of approximated elements a so frequent cleansing and renewal of the elements, or part of them, is necessary as to make their use a matter of much trouble and of great expense. Neither can the dry elements, lately so much extolled and praised, be regarded as the most perfect method of generating electricity. Although I personally have had no experience with the above to argue from, I am still of the opinion that its constancy, and at the same time its usefulness, has only one limitation. This apparatus must also be renewed at certain intervals, so that its use may, in its turn, be quite expensive.

Furthermore, the cleansing of the elements mostly used (chromic acid, with zinc and carbon plates), when undertaken personally, requires much time and care. Otherwise the cleansing is assigned to servants, and in that case one cannot be perfectly sure that the work will be thoroughly performed, and often the battery fails at the moment it is about to be used on a patient.

One of the most important of the organic functions is indisputably digestion. Numerous experiments have been tried on men and animals in order to gain insight, by the disclosures, into the many conditions not yet clear, yet much remains to be done before all the riddles of this so important a factor in the living organism shall have been solved.

In the case of intestinal digestion especially, the duration of the intestinal absorption has not yet been discovered.

The latest experiments tried in this direction (by Dr. Munk) have given most interesting results, which were communicated to the Physiological Society of this place.

An 18-year-old girl with elephantiasis of the left leg, widening of the finest lymphatic vessels, and a lymphatic fistula, gave the desired opportunity for investigation. From the fistula a clear fluid poured when the patient was fasting; after the ingestion of food, a milky, viscid, spontaneously-coagulating, rich fluid was obtainable, which investigation proved to be of the character of chylous lymph. The fluid poured out at the height of fat digestion showed the characteristic peculiarities of chyle, very finely divided fat, and here and there small fat drops.

Within the next thirteen hours following the ingestion of fat there appeared, in some twelve hundred cubic centimetres, about two-thirds of the same again.

At the height of the digestion of fat, the fatty contents of the blood were not visibly increased by the great quantity of fat in the lymph. The fat must therefore have nearly all passed out through the fistula.

By this observation the duration of the absorption of fat by the intestines may be determined.

After the ingestion of oil the absorption of fat commenced in the second hour, attained its maximum in the fifth, and then began slowly to decline. Yet the lymph contained in twelve hours five times as much fat as under conditions of hunger.

Fat more difficult of solution (mutton suet) retarded the absorption, first reaching its maximum in seven to eight hours.

The fat in the chyle was at the same time identical with that ingested.

When fat was injected per rectum, only four to five and a half per cent. was absorbed. The experiment was further tried with lactic acid prepared from rapeseed oil. After the ingestion of this there flowed, after the fourth hour, a milky lymph, in which neither the free, fatty acids nor the soap were especially increased. But fatty acid was obtained from the saponified chylous fat, which was composed chiefly of lactic acid.

Upon admixture with glycerin it formed also the neutral fat in question and appeared in the chyle.

After a rich diet of carbo-hydrates the sugary contents of the lymph was only in a small measure increased during the following hour.

After the ingestion of albumen, in the shape of meat, the lymph became neither richer in albumen, nor did it take even a portion of it up. Neither the sugar nor albumen of food passes from the intestines through the chylous ducts into the blood. Assuredly the passage of these substances into the blood is accomplished directly through the mucous membrane of the intestines.

In regard to the position of the Langenbeck House affairs, the recent report of Professor von Bergmann is at hand; a matter of concern also to our American colleagues, who take such a meritorious and devoted interest in the erection of the building.

The site chosen for the Langenbeck House, on Ziegel Strasse, next to the Surgical Clinic, has already been purchased.

The front of the building will be placed on the water-side, opposite the University Clinic for Women, while the portion towards Ziegel Strasse will be applied to the extension of the Surgical Clinic (removal of the Polyclinic, etc.).

For the building of the house a sum is wanting, which is covered by large donations and by a bequest from the late Empress Augusta. During her lifetime the Empress Augusta pushed on the accomplishment of the plan by strenuous efforts, as it was written of in one of Von Bergmann's works: "The last charitable institution of the Empress Augusta" (*Berlin Hirschwald*). It is certain that the Langenbeck House will be the profitor by this.

On April 1 a special surgical station will be erected in the Moabit City Hospital. This

is the outcome of a pressing necessity, since formerly only very acute cases were admitted to this hospital, while other patients were sent elsewhere. As the Moabit Hospital contains more than eight hundred beds, this change will relieve Dr. P. Guttmann of much burden, as he was the only chief. The command of the new department for surgery will be taken by Professor Sonnenburg.

Considering the superfluity of our preparations of medicines, the recommendation of a new drug is truly a weighty undertaking, especially at a time when the dietetic-hygienic methods of treatment, massage,—in short, the whole army of methods embraced under the title of natural procedures, are more and more on the ascendant.

The opinions expressed in regard to a new drug—"aristol"—are so full of praise that it appears certain the drug will be given further trial as to its composition, its usefulness, and method of action. Aristol is a dithymol-diiodide, and is formed through heating a solution of potassium in potassium chlorate together with an alkaline solution of thymol, the new compound falling down as a reddish-brown amorphous precipitate. It is a fine, reddish-brown, odorless powder, is insoluble in water and glycerin, slightly soluble in alcohol, readily in ether. Warmth and light produce changes in the chemical composition of the preparation, which must be borne in mind when attempting to preserve it.

The action of the medicine seems to be very pleasant; it possesses no toxic qualities.

It has as yet been tried only in dermatological practice, but it has here given very good results; for example, in psoriasis, where especially its non-toxic qualities, as opposed to chrysarobin, place it at the head.

In other derm affections aristol acts quite as well as other drugs, without being so irritating. The result has been very favorable in the case of ulcus cruris, more doubtful in lupus.

The preparation certainly deserves a trial in many cases.

It is hoped that the good results will be further extended, so that the view of its being useful in surgery and gynæcology may not be proven false. It is applied as a ten per cent. ointment (with lanolin), and as a ten per cent. paste (with starch and zinc).

BERLIN, March 15, 1890.

LONDON.

(From our Special Correspondent.)

In my last letter I dealt with some of the aspects of the contagiousness of consumption, and showed that, although many facts seemed to indicate that phthisis was contagious, yet the question could not by any means be considered as settled. This question naturally arose from Koch's discovery of the bacillus tuberculosis, but there is another question which has occupied a large measure of attention on the part of the medical profession during the last seven or eight years,—this is the antibacillic treatment of phthisis.

If the bacillus is the cause of the lesion in phthisis and in so-called scrofulous diseases, it is a ready and easy conclusion to make that a treatment which would kill the organism would also cure the disease, because the healing of the lesion produced by the bacillus might readily be left to nature. On this supposition we should have to consider phthisis as an entity, the only cause of the lesion being the bacillus. It is on some such hypothesis as this that the antibacillus and antiseptic treatment of phthisis is based. Nearly every antiseptic has been tried in the treatment of this disease in a variety of ways: by inhalation, by the mouth, by the rectum, and subcutaneously. By inhalation it was hoped that the antiseptic only would pass down the bronchi, come near the consolidated patch, and be absorbed into it; by the mouth, the drug being absorbed into the circulation, the blood-stream would carry it to the affected part; so, also, in administration subcutaneously; by the rectum, the drug, being absorbed into the portal venous system, would enter the right side of the heart and thus be carried directly to the lungs. Few people would now contend that when an antiseptic is administered by inhalation it would enter a patch of phthisical consolidation. There are many reasons which might be adduced against such an occurrence, both pathological and physiological reasons. In the first place, a mass of consolidation due to recent deposit of tubercle is not directly connected with the bronchial tube, or it would be better to say the majority of the masses of consolidation are not so connected, since, of course, a peribronchial tuberculosis is not infrequently observed. A drug administered by inhalation is absorbed by the vessels of the bronchial tube, and these do not lead into the lung-tissue, but away from it, passing to the root of the lung. And, moreover, a volatile drug taken in with the respired air is not actively carried farther

into the lung than the normal tidal air, if it is carried so far, so that if it got to the end of the bronchial tube it would have to diffuse like the rest of the air in order for this result to be accomplished. This seems a strong reason against an antiseptic drug, taken by inhalation, ever reaching the phthisical consolidation. And, as a matter of fact, there is no very cogent evidence to be adduced in favor of phthisical consolidation being beneficially effected by the inhalations of drugs.

Of antiseptics which have been tried, creosote, turpentine, oleum picis sylvestris, and iodoform are the chief to be mentioned. There is no doubt that beneficial effects have been noticed in cases of phthisis from the use of these inhalations. Of creosote especially much has been written, and most writers seem to be of the opinion that it is beneficial. The explanation of the good effect of creosote and other antiseptics when inhaled in phthisis is probably not far to seek. Such drugs keep the secretion in the bronchial tubes sweet; they tend to diminish chronic bronchial secretion (a common accompaniment of chronic phthisis) and act as stimulant expectorants, and if a phthisical cavity communicates with a large bronchus, the drugs may keep such cavity aseptic. Some practitioners favor iodoform as an inhalation; but its use in phthisis of the lung is more than doubtful, since it may increase the discomfort of the patient. In England, the opinion is fairly general at the Special Chest Hospital that inhalations of antiseptics do not effect the phthisical consolidation, for the reason that the drug never gets to the bacilli. It is otherwise where such a drug as iodoform can be placed directly on the tubercular patch, as in tubercular ulcers of the larynx and in scrofulous glands; here iodoform (and iodol) undoubtedly does good.

One word may be said of the treatment of phthisis by the inhalation of hot air. The tubercle bacillus cannot withstand a heat of 42° C., and it was supposed that the inhalation of superheated air (200° C.) might prove beneficial in phthisis. An apparatus was patented for this purpose; and, as usual, the treatment found stanch advocates, who stated that under the use of hot air the bacilli disappeared from the sputum, the patient lost his cough, gained weight, etc. It was gravely and publicly maintained that this result was due to the hot air entering the air-cells and heating the phthisical patch to a temperature which would kill the tubercle bacillus. Common sense reason might be brought forward against the idea that the lung-tissue could withstand a temperature of 100° C., as one advocate seriously stated; but it has been proved by direct experiment on animals that when air at a high temperature is inspired it does not raise the temperature of the lung-tissue. The hot-air treatment of phthisis may be safely confined to oblivion.

The drug is more likely to reach the tubercular lesion in the lungs if it enters either the general or the pulmonary circulation, which it may do either when given by the mouth or rectum or when injected subcutaneously.

Of the drugs used by mouth, creosote finds its advocates; it has to be used for months, and as much as ten to fifteen minims require to be taken daily, after commencing with the usual small dose. In the hands of impartial practitioners it has not proved of much service and is apt to derange the digestive functions considerably.

Some of the active principles of elecampane (especially helenine) have been recommended for tubercle. Marpmann performed some experiments which tended to show that when administered to animals these substances prevented the development of tuberculosis after inoculation with tuberculous material. It remains to be seen whether they will prove of any service in man.

Phenylacetic and phenylpurpuric acids were shown by Dr. Burdon-Sanderson to be powerful antiseptics, and they have been recommended for phthisis: no deductions can be drawn, however, from the trials as yet made.

Subcutaneous injections of substances in phthisis may be dismissed in a few words, since it has been found that there is so much local irritation following the injection that the treatment has soon to be abandoned. There is also one great drawback to the methods of trying to reach the phthisical convolutions with antiseptics through the circulation, and that is that such substances are probably readily decomposed in the body; and that when, as in the case of iodoform, they are in part in an undecomposed state in the circulation, they are present in a dangerous amount and produce toxic symptoms.

At present, it may safely be said that the antibacillic treatment of phthisis is a failure. It is impossible to say why some cases get well, but that they certainly do with ordinary treatment, fresh air, cod-liver oil, tonics, and they get well just as rapidly as those treated with antiseptics. It may be that an

antiseptic will be discovered which is harmless to the human body but is powerful enough to kill the tubercle bacillus when introduced into the circulation, but at present such a substance is not known, and practitioners are justified in relying on general hygienic measures and tonics in the treatment of the disease.

Notes and Queries.

ABRUS-POISONING.

Abrus-poisoning by the seeds of the jequirity, or the *Abrus precatorius*, first came into prominent notice about ten years ago, and since that time numerous investigations have been made into the nature of the poison. The conclusions derived from these researches have been curiously conflicting, and it is but recently that something definite has been ascertained regarding the active principle or principles, in stem and seed, to which the jequirity owes its poisonous qualities. The *Abrus precatorius*, it will be remembered, belongs to the natural order Leguminosæ; it is one of the most common plants in India, and it is called the Indian licorice plant. It takes a position in the Indian Pharmacopœia as a substitute for licorice; an example, among many others, that could be quoted of the obsoleteness and need of revision of the Indian Pharmacopœia. The effect on a child who had its gums lanced, and who was given to suck the stem of the *Abrus precatorius*, instead of a piece of licorice, could, in the light of the numerous investigations that have been made, be easily predicted.

The seeds are spherical, smooth, sometimes of a bright, shining red color, sometimes white with a black mark at the eye, or, more rarely, black with a white eye. Both in India and Brazil they have been used as a popular remedy in ophthalmia, their action being that of a local irritant. A watery infusion of the seeds produces severe inflammation of the conjunctiva when a few drops are placed in the eye, and is in the highest degree fatal to an animal when injected under the skin, death ensuing within a short period. Dr. Warden, of the Calcutta Medical College, who, first by himself, and then in conjunction with Dr. Waddell, carefully investigated the action and proximate composition of the poison, points out in his notes on the indigenous vegetable poisons that, in the Hindoo system of materia medica, the seeds of the *Abrus precatorius* are classed with what are called the seven minor poisons. These are opium, datura, roots of *Gloriosa superba*, roots of *Nerium odorum*, juice of *Calatropis gigantea*, and *Euphorbia nerifolia*. In fact, the dangerous properties of the seeds of the *Abrus precatorius*, when inserted under the skin, seem to have been long known to the natives of India, and this knowledge has been frequently made use of by men of the chanar class to poison cattle for the purpose of procuring hides. To Dr. Center, of Lahore, probably belongs the credit of first drawing attention to the fact that the jequirity-seeds were used in this way for cattle-poisoning. It appears that the seeds are pounded, moistened, and shaped into needles, and when these are dry they are fixed on a sort of handle. The cattle are spiked with the needle-shaped seeds, and soon succumb from the effects of the poison. Unless the animals are carefully skinned and the inside of the hides examined, detection is almost impossible.

It was thought at first that the poison was due to the smearing of snake venom on the seeds. Dr. Ewart, however, soon disposed of this theory by showing that the poisonous effects in no way resembled those of snake-poison. None of the nerve symptoms, such as local paralysis of the respiratory muscles, convulsions, and unconsciousness immediately preceding death, which accompany snake-poison, were present, while rapid and extensive cellulitis, inflammation of the sympathetic glands, rise of temperature, and great depression of the vital powers, ending in death, commencing at the heart, were the characteristics of jequirity-poisoning. The question as to what the toxicity was due seems to have remained unanswered for some time until a bacillus was found, which was called the jequirity bacillus, the nature of which was investigated by Sattler, Corneil, and Berlioz. The bacillus theory, however, was not destined long to hold its own, but that it gained so much support shows to what absurd lengths a theory based on insufficient grounds or experimental evidence may be carried when preconceptions are in its favor.

To Dr. Klein is due the credit of being the first to throw doubts on the bacillus theory by showing that the poison was permanently destroyed by momentary boiling of the infusion; but it was reserved for Dr. Warden and Dr. Waddell, by their careful and well-conceived experiments, to finally and effect-

ually dispose of the bacillus nature of the abrus poison. They most clearly demonstrated that the poisonous activity of the seeds were due to a proteid body, which they called abrin, and this abrin they considered to be closely allied to egg albumen and the vegetable albumens. These experiments of Drs. Warden and Waddell were carried out in 1884. They do not appear, however, to have settled the question altogether, for, owing to some discrepancies noted, two other observers have entered the field of research, and taken up the subject where Dr. Warden and Dr. Waddell left it. The discrepancies, which happened to be of a chemical nature, induced Dr. Sidney Martin and Dr. R. N. Wolfenden to undertake a series of investigations into abrin, and to study its physiological action. The results of their investigations have been recently communicated to the Royal Society, London. It appears that the abrin of Warden and Waddell can be still further analyzed, and is found to consist of two proteids, to which the experimenters have given the names, respectively, of paraglobulin and albumose, and that each of these proteids has practically the same physiological properties on pigeons. Each produces severe conjunctivitis when applied to the eye; and, when subcutaneously injected, each causes local inflammation, œdema, and ecchymoses and gastro-intestinal irritation, with extrusion of fæces and blood. The general symptoms being, first, a great fall of body temperature and a condition of stupor ending in death. The activity of both these proteids is destroyed by moist heat. In solution the activity of the globulin is destroyed at between 75° and 80° C., and that of the albumose between 80° and 85°. Drs. Martin and Wolfenden, moreover, are of opinion that the abrus poison resembles snake venom in chemical composition, in the local lesions produced, in producing a fall of temperature, in causing semifluidity of the blood after death, and to some extent in the effect of moist heat on it, though they admit that the abrus poison is much less active than snake venom. In reference to this point of resemblance to snake venom, Drs. Martin and Wolfenden do not state whether these opinions are founded on any experiments on pigeons poisoned with snake venom. Dr. Ewart's experiments in dogs seemed, on the other hand, to show there was a marked difference in symptoms and in the centres acted upon by the two poisons.—*Indian Medical Gazette*, November, 1890.

THE ACTIVE PRINCIPLE OF THE CONDURANGO BARK.

PROFESSOR R. KOBERT states (*Schmidt's Jahrbücher*, 1889, No. 9) that he has found two glucosides and a resin in condurango bark, the remedy which at one time enjoyed considerable reputation in the treatment of cancer. The so-called "condurangin" is a mixture of glucosides which in watery solution coagulate when heated to 40° C., and when the watery solution is precipitated with common salt, in these respects resembling an albumen. In hot decoctions no trace of condurangin is to be found after filtration. This glucoside possesses a marked action upon the nervous system. In small doses it produces an ataxic gait, with increased skin and tendon reflexes. Larger doses produce violent clonic convulsions, with subsequent paralysis. In the earlier stages of the poisoning there is marked salivation in carnivora, but no pathological changes can be recognized on post-mortem examination. The fatal dose for carnivora amounted to ⅓ of a grain for every two pounds of body-weight, while in herbivora it is about three times as much.

SALINE INJECTIONS INTO VEINS IN DIABETIC COMA.

The striking case related by DR. DICKINSON at the last meeting of the Clinical Society is somewhat encouraging as to the value of intravenous injection of saline fluids in cases of diabetic coma, although, unfortunately, a fatal issue eventually ensued, for after the first injection—of 106 ounces—the patient regained consciousness to a very complete extent. The importance of such a respite may occasionally be very great,—for instance, in the case of one who is attacked with diabetic coma without having made his will. It is something to know that by this method the coma can, temporarily at least, be made to pass away. The subsequent course of Dr. Dickinson's case is equally instructive. The patient relapsed into coma, and resort was again had to the procedure which had already proved of service. But this time the amount of saline fluid received into the circulation was actually more than the estimated average total amount of blood in the adult body. In spite of the state of plethora which so heroic a course must have produced, the patient once more regained consciousness. Dr. Dickinson's conclusions, that 100 or even 200 ounces of saline fluid may in such cases be introduced into the circulation with advan-

tage, but that the benefit to be gained thereby can only be temporary, were doubtless justified by the experience in this case. Perhaps the same end might be obtained more rapidly if the injection were preceded by venesection, so as to secure a greater degree of dilution of the blood with a comparatively small amount of the diluent. The practice of saline injections in diabetic coma has, as Dr. S. Mackenzie remarked, been frequently employed, but so far as we know, in no case with permanent good results. Indeed, few patients submitted to this treatment have, as in Dr. Dickinson's case, regained consciousness even for a short time.—*Lancet*, March 8, 1890.

DUBOISINE.

As some uncertainty appears to exist as to the identity of the basic substance met with in commerce under the name "duboisine," it may prove useful just now to recapitulate the principal points in its history. In April, 1874, MR. GERRARD described at an evening meeting of the Pharmaceutical Society a mydriatic alkaloid that he had separated from the leaves of the Australian *Duboisia myoporoides*, which was provisionally named "duboisine" (*Pharm. Journ.* (8), viii., 787). Six years later Professor LADENBURG examined a sample of "duboisine sulphate," obtained from Merck, of Darmstadt, and came to the conclusion, based principally on the properties of the gold salt, that the alkaloid contained in that sample was in every way identical with hyoscyamine (*Berichte*, xiii., 257; *Pharm. Journ.* (3), x., 789). Subsequently, it having been asserted that duboisine differed from hyoscyamine in its physiological action, Professor Ladenburg was induced in 1887 again to take up the subject, and the result of his examination of a new sample, obtained from Merck as "duboisine," led him to the conclusion that the alkaloid he had to do with in this case was identical with hyoscine, a base that had been found in the mother-liquor obtained in the manufacture of hyoscyamine, and described shortly after the appearance of his previous paper (*Berichte*, xx., 1661; *Pharm. Journ.*, (3), xvii., 1049). A certain amount of mystification was here introduced into the subject by mistranslations of this paper (which appeared in the "Year-Book of Pharmacy" (1888, p. 62) and the *Journal of the Chemical Society* (Abstracts, 1887, p. 740)), in which Professor Ladenburg was incorrectly represented as stating that the alkaloid examined by him on the second occasion was identical with hyoscyamine. Professor Ladenburg, in fact, said expressly that in the second sample no hyoscyamine could be detected, nor any other alkaloid than hyoscine. He suggested, however, that probably the different result was due to some variation in the method of preparation, and that this is the true explanation is rendered probable by some information furnished by Messrs. Schering & Co., in response to inquiries on the subject, which has been kindly placed at our disposal by Messrs. Zimmerman. Messrs. Schering state that a short time ago they worked a quantity of Duboisia myoporoides leaves for "duboisine," and obtained a pure base in the form of a brownish thick liquid, the sulphate of which corresponded exactly and in every respect to the properties of sulphate of hyoscyamine. This they consider confirms the statement of Ladenburg, from which it would appear that they are not acquainted with the Professor's later paper. Moreover it may be remarked that pure hyoscyamine is described by him as a crystalline solid. Messrs. Schering add that hyoscine was obtained from the mother-liquid of the "duboisine sulphate," as well as from belladonna root. It seems probable, therefore, that, as Duboisia myoporoides, like belladonna and henbane, contains both hyoscyamine and hyoscine, the products obtained from it and sent out under the name "duboisine" may consist of the one or the other base, either exclusively or in preponderance, according to the method of preparation.—*Pharm. Journ. and Trans.*, March 1, 1890.

SOLUBLE SACCHARATE OF IRON.

ATHENSTAEDT'S process is given as follows in the *Moniteur Scientifique*, November, 1889: A 1 to 100 solution of a ferric salt is precipitated by an equally strong solution of ammonia or a fixed alkali, taking care to operate at a temperature of about 10° C., and, in all cases, below 15° C. The precipitate must be washed rapidly in the dark and with distilled water, having a temperature between 10° and 15° C. The ferric hydrate is then mixed with powdered sugar in a quantity so regulated that the dry preparation will contain 3 parts of metallic iron to 100 parts of sugar. The mixture of hydrated iron and sugar is maintained at the boiling-point until the iron becomes dissolved in the syrup. The dry product is obtained by drying in vacuo at a

low temperature. This saccharate of iron may be kept in a solution made by diluting the mixture, when cold, with water. These solutions are clear, and remain so indefinitely. —*Amer. Journ. of Pharmacy*, March, 1890.

ANISODUS LURIDUS.

DR. SIEBERT reports some interesting results of an investigation of the *Anisodus luridus*, a Himalayan Solanaceous plant which seem to indicate that the degree of development of the plant may have an important relation to the quantity and nature of the alkaloids occurring in it (*Archiv der Pharmacie*, February 20, p. 145). From flowering plants he reports that he obtained, by fractional precipitation of an acidulated liquid with gold chloride, a "not inconsiderable quantity of hyoscyamine," but no atropine or hyoscine, while from plants collected when the seed had ripened only a very small quantity of atropine could be isolated under the same conditions and no hyoscyamine. The failure to detect hyoscine is thought to be possibly due to insufficiency of the material used.—*Pharm. Journ. and Trans.*, March 1, 1890.

THE MODE OF ACTION OF DIURETICS.

The conditions of the renal circulation are such that, were the mechanism pointed out to one who did not know the function of the kidneys, he might almost deduce the office of these organs. That the secretion of the watery part of the urine is mainly affected under high pressure in the Malpighian tufts, has been proved by numberless experiments since Bowman's time, and that the solids (urea, uric acid, etc.) are separated by the epithelia of the convoluted tubes, may also be said to be a dictum of science. It is admitted that there is still much that is obscure in the renal function; thus, no very satisfactory explanation has yet been given why albumen does not in the normal state filter through the capillaries in the glomerule along with the watery part of the urine. Küss and Wittisch, indeed, affirm that albumen does so filter, and that the epithelium of the convoluted tubes reabsorbs this albumen. It is needless to say, however, that the experimental demonstration of this view is wanting; it appears, in fact, to be negatived by experiments of Ribbert, who has in rabbits collected the urine as it is excreted by the Malpighian corpuscles, and found it to be watery and free from coagulable albumen.

As for the character of the products which filter through the renal parenchyma, much importance has been assigned to the "intelligent" action of the epithelia lining the glomeruli and Henle's loops; the main ingredients of the urine are believed to be selected by these cells, which, in the language of Vulpian, "separated from the blood the water and the divers soluble substances which enter into the composition of that fluid."

But there is another factor which has a powerful influence on the secretion of the urine,—namely, the blood-pressure in the renal capillaries. The experiments of Ludwig and his pupils have shown that the amount of urine secreted depends very closely upon the pressure of blood in the Malpighian bodies.* This pressure will depend on the proportion of liquid in circulation, on the force of the heart, and on the contractility of the vascular system. From very accurate experiments made by Runeberg, and confirmed by Lecorché and Talamon, it appears that in a given time more liquid filters into the glomerules and uriniferous tubules under high pressure than under low pressure.† This is what might have been expected from known physical principles, for the kidney is not only a secretive but also a dialyzing organ.

From what has been said, it will be seen that the most general division that we can make of diuretics is the twofold division into (1) substances which, when taken into the circulation, raise the blood-pressure in the kidneys; and (2) substances which stimulate the cortical epithelium to increase of function. This is essentially the classification given by Gubler and Professor Sée. The first division,—that is, those substances that increase vascular tension, includes what Gubler calls *tension diuretics;* the second division consists of substances which, in passing through the kidney, excite directly its tissue,—these he calls *excitant diuretics*. The latter is the same as Sée's second group,—that is, medicines which promote diuresis by favoring dialysis.‡ Lauder Brunton's classification is essentially the same.

Of all the agents by which the urinary flow is augmented, one of the best is undoubtedly

* Lauder Brunton.

† "Traité de l'Albuminurie et du Mal de Bright."

‡ Gubler, "Leçons de Thérapeutique," "Medicaments Diuretiques;" G. Sée, *Bull. de Thèr.*, t. xciv., "An Attempt at a Physical Classification of Medicaments."

water, the free ingestion of which both raises the blood pressure in the kidneys and excites the epithelium to increased work. For it has been demonstrated that the epithelium of the convoluted tubes separates water as well as urea and saline principles from the blood. Gubler regards water as the best excitant diuretic; it certainly belongs to the first group as well, for it flushes the kidney and raises the vascular tension. Certain mineral-waters add to the natural diuretic effect of their water, the specific effect on the renal cells of their saline principles. Most of the diuretic plants act best when given in infusion or decoction, though many of them contain resins, essential oils, tannin, and salts, which, in the language of one school, stimulate the secreting cells, in the language of another school, promote dialysis by modifying the dialyzing membrane; it is still probable that these vegetable preparations when given in the form of ptisanes produce diuresis principally through their water.

Among the tension-promoters we have those that act generally, such as digitalis, caffeine, convallaria, which cause diuresis by their effect on the cardiac fibre, and such as act locally,—that is, on the vessels of the kidney itself. Among the latter are certain medicaments which are believed to dilate the different vessels of the kidneys. It is well-known that a certain amount of active vaso-dilatation in the renal cortex is essential to a free renal secretion, while any considerable vaso-constriction in the different vessels is attended with lessened urination, if not with positive anuria. Among the substances which dilate the afferent vessels, we have the nitrates, alcohol, and perhaps urea (Lauder Brunton).

Pressure in the glomerulus is also raised by vaso-constriction of the efferent vessels, the production of which, Lauder Brunton thinks, is one of the effects of the administration of broom, turpentine, juniper, copaiba, and cantharides. These latter, however, are classed by Gubler among the excitant diuretics; their real mode of action is still largely a matter of conjecture. Among the medicaments which doubtless cause diuresis by direct action on the secreting cells of the kidney, are calomel, acetate of potassium, liquor potassæ, and nitre, which latter is regarded by Gubler as the best and most certain of mineral diuretics.

It remains to notice (and this we do with little comment, there is still so much that is obscure in the action of medicines on the kidneys) the classification of diuretics given by Dujardin-Beaumetz in the last (sixth) edition of his "Leçons de Clinique Thérapeutique."

1. Medicaments which modify the blood-pressure, either by energizing the cardiac systole, or by acting on the muscular element of the circulatory system, for example, the so-called heart tonics, and strychnine, ergot, etc.

2. Substances which produce diuresis by both augmenting the pressure and modifying liquids. Of this class, the typical example is water.

3. Medicaments which act as diuretics by promoting dialysis, for example, nitrate of potassium, nitrate of sodium, acetate of potassium. These medicaments have a real disadvantage, in that they irritate both the digestive tube and the renal parenchyma.

4. Medicaments which have the property of modifying the dialyzing membrane. They actively congest the kidney. The resins and balsams form this class. They increase the secretion of urine, but the urine is profoundly modified; hence they render greater service in diseases of the urinary passages by lessening the effects of putridity of the urine than by any real diuretic action.

The above classification is another attempt to refer the mechanism of the urinary secretion to strictly physical principles, and makes no account of the functions of the epithelium, without which that secretion would be reduced to the level of an exudation,—it would not be urine.—*Boston Medical and Surgical Journal*, February 6, 1890.

SCOPOLIA ATROPOIDES.

A communication upon the constituents of *Scopolia atropoides*, by DR. SIEBERT, a pupil of Dr. E. Schmidt, of Marburg, appears in the new number of the *Archiv der Pharmacie*, February 20, p. 139. It will be remembered that this name was quoted by Mr. Holmes in his recent paper before as a synonyme for *Scopolia carniolica*, but in the absence of information as to the plant examined by Dr. Siebert, beyond the statement that the materials were obtained from the gardens at Karlsruhe and Marburg, it cannot be said positively that it is identical with the subject of Professor Dunstan's recent investigation, though this seems very probable. Dr. Siebert reports that he obtained hyoscyamine from both the leaves and the roots. Atropine was also obtained in relatively small quantity, but it is thought that it may possibly have been a product of alteration. Hyoscine

could not, from want of material, be isolated in a state of chemical purity, but in a foot-note it is stated that pure hyoscine aurochloride was subsequently obtained by Dr. Siebert in working upon "Hungarian scopolia root." In another foot-note Dr. Schmidt, referring to the previously reported occurrence of atropine, together with hyoscyamine and hyoscine, in *Scopolia japonica* root, says that in working upon a fresh quantity of roots under different conditions he obtained only a very small quantity of atropine in the last mother-liquor from the gold salts, so that probably it was a product of alteration. The other constituents observed by Dr. Siebert in *Scopolia atropoides* were scopoletin, the fluorescent body found also in the roots of belladonna, henbane, and *Scopolia japonica*, together with betaine and choline.—*Pharm. Journ. and Trans.*, March 1, 1890.

THE CAUSE OF PALLOR.

Dr. Oppenheimer has published some careful observations on the blood of one hundred and nine pale female subjects (servant girls) conducted by means of Zeiss and Thomas's hæmocytometer and Gowers's hæmoglobinometer. He considers the lowest number of corpuscles per cubic millimetre in a normal state of health as four million, and the lowest amount of hæmoglobin in health ninety per cent. He also agrees with Gräber's dictum: "Number of corpuscles and hæmoglobin both diminished = acute and chronic anæmia. Number of corpuscles diminished, hæmoglobin relatively increased = primary chlorosis or pernicious anæmia. Number normal, hæmoglobin diminished = chlorosis." In severe cases of chlorosis, with tendency to faintness, headache, heart symptoms, and œdema without albuminuria, the hæmoglobin varied from thirty to fifty per cent. In fifty-five of the cases the condition of the blood was normal. These patients were found to be suffering from phthisis, cardiac disease (compensated), gastric ulcer, and various affections of stomach, intestines, or genital organs. Phthisis of itself—that is to say, before hemorrhage or diarrhœa or profuse expectoration had come on—appeared to have no effect on the blood. An interesting result was obtained in connection with gastric ulcer. In simple ulcer the blood was normal, except when there had just been hæmatemesis, but in carcinoma of the stomach both the number of the corpuscles and the hæmoglobin were subnormal. Pale girls sometimes take iron for a long time without any visible improvement. Dr. Oppenheimer finds that such patients are not anæmic, but chlorotic from some uterine or other affection, so that when the blood is found to be normal it is advisable to make a vaginal examination. The pallor of patients with normal blood appears to be due to the insufficient filling of the cutaneous capillaries. From the observations of Dastre and Morat there would seem to be an antagonism between the blood-vessels of the skin and those of the abdomen; so that if one of these systems becomes dilated, the other, by an automatic reflex action, invariably becomes contracted. Because of the fact that irritation of the depressor nerve of the heart induces dilatation of the abdominal vessels and contraction of the cutaneous vessels, Dr. Oppenheimer believes that the pallor of phthisis, cardiac diseases, and kidney mischief is due to reflex action. In these affections the heart has extra work to do, and this affects, by means of the depressor nerve, the vaso-motor centre, causing a diminution of the cutaneous flow, and consequently a dilatation of the abdominal vessels. The pallor observed in most inflammatory affections of the hypogastric viscera may probably be explained also by the reflex action of the hyperæmic abdominal vessels upon the calibre of the cutaneous vessels.—*Lancet*, March 1, 1890.

GUARANA IN CHRONIC DIARRHŒA.

In the *American Journal of Pharmacy* for February, 1890, Mr. J. T. Shinn publishes a note from Dr. J. Frazer Boughter as to the use of guarana powders in cases of long-standing diarrhœa. Only one case is reported, that of a soldier, who for two years had been troubled with chronic diarrhœa, and at the time of writing had been in the hospital for two months, with eight or ten movements in twenty-four hours. All the vegetable and mineral astringents were tried, with only partial and temporary relief. It was then decided to give him the guarana powders, one powder being given twice daily for several days, and only one powder being given afterwards for several days. It is stated that at once, after the administration of the first powder, the number of passages from the bowels diminished rapidly, and by the time seven or eight powders were given, he had but one passage in thirty-six hours. Dr. Boughter attributes this rapid change for the better to the guarana, as he stopped all other medicine while administering it. The good effect which it seems to

have produced in this case, though a solitary instance, leads to the belief that it is worthy of more extensive trial by the medical profession.

THE INFECTION OF CATGUT LIGATURES.

At the meeting of the Society of German Naturalists and Physicians, recently held in Heidelberg, DR. C. BRUNNER reported a number of experiments which he had made as to the infection of catgut ligatures (*Deutsche Medicinische Wochenschrift*, March 6, 1890). He found that while sublimate catgut and catgut disinfected by dry heat remained perfectly sterile, catgut ligatures treated with carbolic or chromic acids and with the oil of Juniper, placed in cultures, developed numerous colonies of bacteria. He also found that oil of juniper was perfectly incapable of preventing the development of the micrococci of splenic fever obtained from the rabbit infected with this disease after thirty-six hours' action, while six hours' action of the sublimate of a one per thousand solution, two hours' action of dry heat of 140°, or a twelve days' contact with a 20 per cent. solution of carbolized oil solution, were able to entirely prevent further development of the germs.

ADULTERATION OF TEA IN CHINA.

For a number of years the Chinese have been exporting into Europe a tea-leaf which has a peculiar external appearance, to which the name of "gun-powder tea" has been given. This leaf, which does not possess the physiological properties of the true China tea, is sold as a distinct commercial species under the name of "Imperial Chinese tea," although sometimes it is mixed in varying proportions with true tea-leaves, which more or less approach it in its external characteristics. Specimens of this tea have been recently subjected to chemical analysis by MESSRS. RICHE and COLLIN (*Répertoire de Pharmacie*, February 10, 1890), who in comparing the result with Hyson tea have stated that the ash of both specimens is about the same.

As regards the presence of theine, the authors were unable to obtain any crystalline alkaloid in the so called gun-powder tea, but only a greenish, viscid substance, and the authors hence concluded that those teas which do not contain theine cannot be the leaves of the *Thea Chinensis*. Further, it is claimed that this tea when rubbed up between the fingers leaves a yellowish-brown stain, and when the powdered tea-leaves are treated with dilute sulphuric acid they become discolored and assume a blue color on the addition of caustic potash.

These results, the authors claim, prove that the tea is contaminated with prussian blue, for a dense blue color is produced if they are added in the presence of an acid to a salt of iron. Further, the botanical characteristics of the leaves do not correspond with those of the *Thea Chinensis*, although the authors have been unable to determine from what plant they are obtained.

THE EFFECTS OF ANTIPYRIN IN WHOOPING-COUGH, CHOREA, AND ENURESIS.

Considerable evidence has been advanced as to the value of antipyrin in the treatment of whooping-cough and chorea. In his graduation thesis DR. JEAN BOUISSON (*Lyon Médical*, February 9, 1890) gave an account of a number of his own experiments. In whooping-cough his results were practically nil, but in chorea, on the other hand, his success was most remarkable. Of nineteen patients treated with antipyrin, eleven were completely cured, while six were greatly improved; and even in two extremely severe cases there was great improvement in the patients' condition. In nocturnal incontinence of urine, however, his results were most striking: eight patients suffering from this affliction were treated with antipyrin and all eight were completely cured, although a number of them had suffered from nocturnal incontinence for years and had proved rebellious to all treatment. After the cessation of treatment the eneuresis did not again appear. The amount given in twenty-four hours varied from thirty to sixty grains, according to the age of the children. The author advises its administration in some alkaline liquid, Vichy water for example, rendering it more readily taken by children. It may be sweetened with syrup.

MENTHOL IN THE VOMITING OF PREGNANCY.

Menthol has been recommended (*Répertoire de Pharmacie*, February 10, 1890) in the treatment of obstinate vomiting of pregnancy; one part of menthol should be dissolved in twenty parts of alcohol and thirty parts of simple syrup, a teaspoonful being given each hour. This prescription is claimed to be extremely successful in arresting nausea and vomiting.